NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 7
615 Erie Boulevard West, Syracuse, NY 13204-2400
P: (315) 426-7519, (315) 426-7551 | F: (315) 426-2653
www.dec.ny.gov

June 4, 2021

John Hickey
Interim Manager, Syracuse
Bristol-Myers Squibb Company
PO Box 4755
Syracuse, NY 13221

Re: Bristol-Myers Squibb Restoration Area, Site ID No. C734138
Village of East Syracuse, Town of DeWitt, Onondaga County
Building 55 Area Petroleum IRM Work Plan

Dear Mr. Hickey:

The New York State Department of Environmental Conservation (Department) reviewed the letter dated June 3, 2021 which was sent in response to the Department's letter dated May 21, 2021 regarding the Building 55 Area Interim Remedial Measure (IRM) Work Plan (work plan) for the Bristol-Myers Squibb Restoration Area (site). The June 3rd letter and the work plan were prepared by Arcadis of New York, Inc. (Arcadis) on behalf of the Bristol-Myers Squibb Company (BMS). The letter is generally acceptable, except that groundwater monitoring well screens must not exceed 10 feet in length, monitoring wells must be installed to straddle the water table, and monitoring wells must be installed to monitor groundwater conditions down to the top of the till. If the conditions require nested wells to achieve all of these requirements, then nested well pairs must be installed for the affected locations.

BMS must obtain and comply with any necessary State, local or federal permits.

The Department requires notification at least seven days in advance of field work.

Please send the approved work plan, along with the modification letters, to the document repository, and instruct the repository to replace the draft work plan with the approved plan. If you have any questions, please do not hesitate to contact me at 315-426-7411 or joshua.cook@dec.ny.gov.

Sincerely,

Joshua P. Cook, P.E.
Professional Engineer 1

ec: Gary Priscott (NYSDEC)
Joshua Cook (NYSDEC)
Scarlett McLaughlin (NYSDOH)
Sara Bogardus (NYSDOH)
John Hickey (BMS)
William Pufko (BMS)
Richard Mator (BMS)
Kirk Wolfgang (BMS)
Anne Locke (BMS)
William McCune (Arcadis)
Kevin Jay (Arcadis)

Mr. Joshua Cook, P.E.
Professional Engineer 1
New York State Department of Environmental Conservation
Region 7
615 Erie Boulevard West
Syracuse, NY 13204

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Phone: 315 446 9120
Fax: 315 449 0017
www.arcadis.com

Date: June 3, 2021
Our Ref: 30089664
Subject: Bristol-Myers Squibb Restoration Area, Site ID No. C734138
Village of East Syracuse, Town of DeWitt, Onondaga County
Building 55 Area Interim Remedial Measures Work Plan

Dear Mr. Cook,

On behalf of Bristol-Myers Squibb (BMS), Arcadis of New York, Inc. (Arcadis) responds to the May 21, 2021 New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) comments on the March 2021 revised Building 55 Area Interim Remedial Measures (IRM) Work Plan (the Work Plan) for the BMS Restoration Area Project in East Syracuse, New York (the site).

For convenience, each NYSDEC comment is presented below in bold, followed by the BMS response.

1. **Section 3.6.3, Final Paragraph – Samples of imported fill must be analyzed by a laboratory approved by the NYSDOH Environmental Laboratory Approval Program. The sampling frequency for material imported from a virgin mine must be the same as described for other sources of fill. A reduced sampling frequency is only acceptable if the material meets the requirements of paragraph 5.4(e)5. of the Department's guidance document *DER-10: Technical Guidance for Site Investigation and Remediation* dated May 2010, as updated by its Errata Sheet (DER-10).**

   Response:

   BMS acknowledges the comment and understands the regulations presented in DER-10. Materials not meeting the requirements of Section 5.4(e)5 will be sampled in accordance with the requirements for semi-volatile compounds as listed in Table 5.4 (e)10 of DER-10.

2. **Section 4.4 – Given the relatively short construction period, progress meetings must be held weekly.**

   Response:

   Construction progress meetings/calls will be held weekly. NYSDEC and NYSDOH will be invited to each meeting/call.

3. **Section 5.1 – The work plan asserts that the proposed technology may be effective at reducing DCHA concentrations. Based on the data collected to date, it appears the spatial distribution of dicyclohexylamine (DCHA) in the Building 55 Area is not the same as the petroleum distribution. For example:**

- **the greatest concentrations of petroleum-related compounds in this area of the site is present at PDI-SB-01 at 8-10 feet below grade, whereas the greatest concentration of DCHA in this area of the site is present at PDI-SB-13 at 6-8 feet below grade**;

- **the second greatest concentration of DCHA in this area of the site is present at PDI-SB-22, whereas there was very limited petroleum-related contamination identified at PDI-SB-22; and**

- **for PDI-SB-01, the concentrations of petroleum-related compounds were significantly less at 16-16.9 feet below grade when compared to 8-10 feet below grade, whereas the concentration of DCHA was slightly greater at 16-16.9 feet below grade than at 8-10 feet below grade; etc.**

Furthermore, in certain locations, DCHA concentrations increased with increasing depth below grade. Therefore, in order to adequately determine the extent to which the proposed technology is effective at reducing concentrations of DCHA, the groundwater monitoring network must include wells to monitor the upper portion of the fill/glaciolacustrine unit and wells to monitor the deeper portion of the fill/glaciolacustrine unit. It is recommended this include, at a minimum, a five-foot long well set at the top of till at: BDA-12; BDA-13; near the upgradient side of the treatment zone; and possibly one in the middle of the treatment zone.

Response:

We agree the spatial distribution of the DCHA in the Building 55 Area is not the same as the petroleum distribution. We also agree that DCHA was observed at higher concentrations in the deeper samples in 2 of the 5 locations where multiple depths were sampled supporting the need to monitoring groundwater to the base of the fill/glaciolacustrine unit within the treatment area. However, based on DCHA's density of 0.91 grams per cubic centimeter (g/cm^3) and solubility of 800 mg/L at 20 degrees Centigrade, we do not expect DCHA would exhibit significant sinking behavior in groundwater. Groundwater samples collected during the PDI indicate that DCHA is migrating into the Building 55 treatment area and is detected in multiple areas of the BMS site.

The depth to the top of till was observed to range from about 12.4 (B55-PDI-SB-12) to 18.6 (B55-PDI-SB-2) feet below ground surface (ft bgs) across the treatment area. This results in a water column thickness of only seven to 13 feet, assuming a depth to groundwater of five ft bgs. Therefore, it would be more appropriate to install wells with well screening the full saturated thickness of the unit at each location than to install multiple well screens monitoring upper and lower portions of the unit. The existing monitoring wells BDA-12WT and BDA-13WT were initially included in the proposed monitoring program as they are the closest downgradient monitoring wells to the Building 55 Area beyond BDA-14WT. However, because these wells are located between 150 and 200 feet downgradient of the treatment area, we do not expect changes to DCHA concentrations to be apparent in these wells for an extended period following initiation of the treatment system. The combination of DCHA migrating into the treatment area in groundwater, the distribution of dissolved DCHA in groundwater, the thickness of the water bearing zone and DCHA's physicochemical properties support performance monitoring from monitoring wells closer to the treatment area, and from a single well screen within the fill/glaciolacustrine unit (rather than nested wells). Therefore, to effectively monitor performance downgradient of the IRM, it would be more effective to install a pair of new monitoring wells approximately 40 feet downgradient of the treatment area.

Eight combination borehole heat exchanger (BHE)/extraction wells proposed as part of the IRM will also serve as performance monitoring wells within the treatment area. To facilitate monitoring of groundwater conditions to the base of the fill/glaciolacustrine unit within the treatment area, the screened interval of these wells will extend to the top of the till based on drilling observations during their installation (the proposed BHE/extraction wells were originally proposed to extend to 15 ft bgs). Also, an additional monitoring well will be installed to the top of the till upgradient of the treatment area (Proposed Borehole Heat Exchanger, Thermocouple Point, and Trenching/Piping Layout Figure) to monitor upgradient groundwater conditions. Sampling the above-listed

wells, plus existing monitoring wells BDA-12WT, BDA-13WT and BDA-14WT, will provide a profile of DCHA concentrations upgradient, within and downgradient of the treatment area.

The Proposed Borehole Heat Exchanger, Thermocouple Point, and Trenching/Piping Layout figure has been updated and included as an attachment. The revised figure illustrates the proposed location of the additional monitoring well near PDI-SB-21. Table 5.1 has been updated to include the newly installed monitoring well near PDI-SB-21 and presented below.

Table 5.1 TISR™ System Performance Monitoring Program

Location	Matrix	Analytical Parameters	Frequency
Baseline Monitoring			
BHE/EW-1 – BHE/EW-8, BDA-12WT, BDA-13WT, BDA-14WT, and three proposed IRM monitoring wells	Water	VOC (USEPA SW-846 Method 8260C)	Once
		SVOC (USEPA SW-846 Method 8270C)	
		Glycols (USEPA SW-846 Method 8015D)	
		Aldehydes (USEPA SW-846 Method 8315A)	
		Natural Attenuation Parameters	
		System Temperature Readings	
Performance Monitoring			
BHE/EW-1 – BHE/EW-8, BDA-12WT, BDA-13WT, BDA-14WT, and three proposed IRM monitoring wells	Water	VOC (USEPA SW-846 Method 8260C)	Quarterly for the first year of operations, then at reduced frequency, as appropriate.
		SVOC (USEPA SW-846 Method 870C)	
		Glycols (USEPA SW-846 Method 8015D)	
		Aldehydes (USEPA SW-846 Method 8315A)	
		Natural Attenuation Parameters	
		System Temperature Readings	Monthly

4. **Section 5.2 – The system vents and the space around the treatment areas should be monitored regularly to determine if the system is producing air impacts above community air monitoring action levels. If action levels are exceeded, then corrective actions will be required.**

Response:

As requested, air monitoring will be conducted in accordance with the Community Air Monitoring Plan over an eight-hour period once weekly for the first month following system startup to determine if the system is producing air impacts above the community air monitoring action levels. Corrective measures will be taken to address any impacts above community action levels.

5. **Section 7 – The Operation, Maintenance and Monitoring (OMM) Plan must be approved prior to system startup. It is recommended the draft OMM Plan be submitted more than 6 weeks prior to the desired/anticipated startup date.**

   Response:

   The OMM Plan will be submitted for regulatory review more than 6 weeks prior to the anticipated startup date. It is anticipated that the remedial system will be operational by the end of August. Therefore, the OMM Plan will be submitted no later than July 20, 2021 to provide NYSDEC with an adequate review period.

If you have any questions regarding this Building 55 Area IRM Work Plan Letter Response or require additional information, please contact Anne Locke of BMS at anne.locke@bms.com or 315-432-2260.

Sincerely,
Arcadis of New York, Inc.



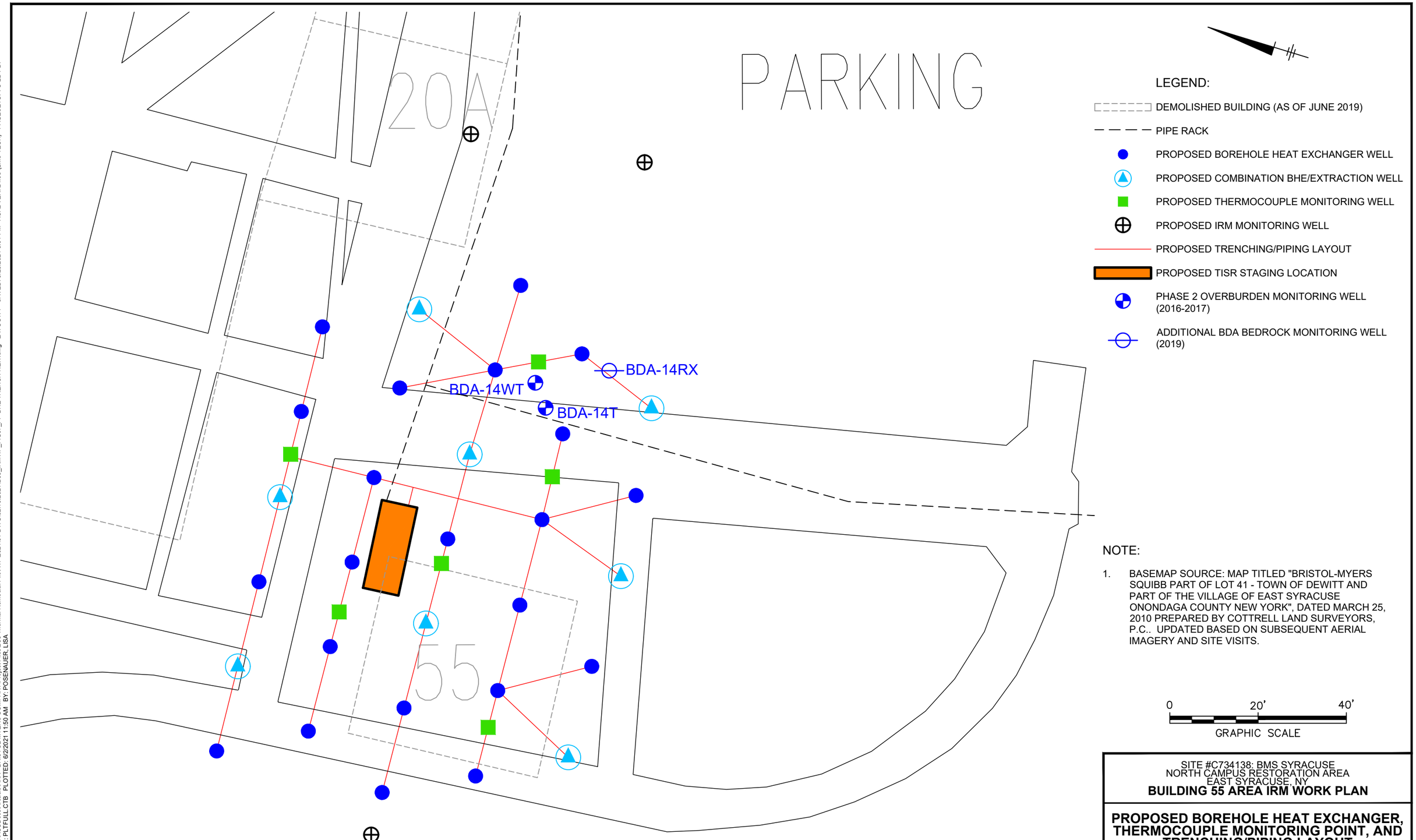
Kevin Jay, P.E.
Program Remedial Engineer

Email: kevin.jay@arcadis.com
Direct Line: 724-742-9523

CC. Gary Prescott, NYSDEC
Scarlett McLaughlin, NYSDOH
Sara Bogardus, NYSDOH
Nathan Trembath, BMS
William Pufko, BMS
Richard Mator, BMS
Kirk Wolfgang, BMS
Anne Locke, BMS
William McCune, Arcadis

Enclosure

Figure 7 - Proposed Borehole Heat Exchanger, Thermocouple Monitoring Point, and Trenching/Piping Layout



LEGEND:

- DEMOLISHED BUILDING (AS OF JUNE 2019)
- PIPE RACK
- PROPOSED BOREHOLE HEAT EXCHANGER WELL
- PROPOSED COMBINATION BHE/EXTRACTION WELL
- PROPOSED THERMOCOUPLE MONITORING WELL
- PROPOSED IRM MONITORING WELL
- PROPOSED TRENCHING/PIPING LAYOUT
- PROPOSED TISR STAGING LOCATION
- PHASE 2 OVERBURDEN MONITORING WELL (2016-2017)
- ADDITIONAL BDA BEDROCK MONITORING WELL (2019)

NOTE:

1. BASEMAP SOURCE: MAP TITLED "BRISTOL-MYERS SQUIBB PART OF LOT 41 - TOWN OF DEWITT AND PART OF THE VILLAGE OF EAST SYRACUSE ONONDAGA COUNTY NEW YORK", DATED MARCH 25, 2010 PREPARED BY COTTRELL LAND SURVEYORS, P.C.. UPDATED BASED ON SUBSEQUENT AERIAL IMAGERY AND SITE VISITS.

0 20’ 40’

GRAPHIC SCALE

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY

BUILDING 55 AREA IRM WORK PLAN

PROPOSED BOREHOLE HEAT EXCHANGER, THERMOCOUPLE MONITORING POINT, AND TRENCHING/PIPING LAYOUT

ARCADIS Design & Consultancy for natural and built assets

FIGURE 7

C:\Users\lposenauer\ACCDocs\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021101-DWG\02.16.2021\B55_IRMWP_FIG07_PP BHE TRENCH NEW.dwg LAYOUT: 7 SAVED: 5/28/2021 3:04 PM ACADVER: 24.0S (LMS TECH) PAGESETUP: C-LB-PDF
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 6/2/2021 11:50 AM BY: POSENAUER, LISA
XREFS:
BMS-XBASE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 7
615 Erie Boulevard West, Syracuse, NY 13204-2400
P: (315) 426-7519, (315) 426-7551 | F: (315) 426-2653
www.dec.ny.gov

May 21, 2021

John Hickey
Interim Manager, Syracuse
Bristol-Myers Squibb Company
PO Box 4755
Syracuse, NY 13221

Re: Bristol-Myers Squibb Restoration Area, Site ID No. C734138
Village of East Syracuse, Town of DeWitt, Onondaga County
Building 55 Area Interim Remedial Measures Work Plan

Dear Mr. Hickey:

The New York State Department of Environmental Conservation (Department) and the New York State Department of Health (NYSDOH) have reviewed the revised Building 55 Interim Remedial Measures Work Plan (work plan) for the Bristol-Myers Squibb Restoration Area (site), dated March 2021, which was prepared by Arcadis of New York, Inc. (Arcadis) on behalf of the Bristol-Myers Squibb Company (BMS). With the modifications set forth below, the work plan is approved.

1. Section 3.6.3, Final Paragraph – Samples of imported fill must be analyzed by a laboratory approved by the NYSDOH Environmental Laboratory Approval Program. The sampling frequency for material imported from a virgin mine must be the same as described for other sources of fill. A reduced sampling frequency is only acceptable if the material meets the requirements of paragraph 5.4(e)5. of the Department's guidance document *DER-10: Technical Guidance for Site Investigation and Remediation* dated May 2010, as updated by its Errata Sheet (DER-10).

2. Section 4.4 – Given the relatively short construction period, progress meetings must be held weekly.

3. Section 5.1 – The work plan asserts that the proposed technology may be effective at reducing DCHA concentrations. Based on the data collected to date, it appears the spatial distribution of dicyclohexylamine (DCHA) in the Building 55 Area is not the same as the petroleum distribution. For example:

    - the greatest concentrations of petroleum-related compounds in this area of the site is present at PDI-SB-01 at 8-10 feet below grade, whereas the greatest concentration of DCHA in this area of the site is present at PDI-SB-13 at 6-8 feet below grade;

- the second greatest concentration of DCHA in this area of the site is present at PDI-SB-22, whereas there was very limited petroleum-related contamination identified at PDI-SB-22; and
- for PDI-SB-01, the concentrations of petroleum-related compounds were significantly less at 16-16.9 feet below grade when compared to 8-10 feet below grade, whereas the concentration of DCHA was slightly greater at 16-16.9 feet below grade than at 8-10 feet below grade; etc.

Furthermore, in certain locations, DCHA concentrations increased with increasing depth below grade. Therefore, in order to adequately determine the extent to which the proposed technology is effective at reducing concentrations of DCHA, the groundwater monitoring network must include wells to monitor the upper portion of the fill/glaciolacustrine unit and wells to monitor the deeper portion of the fill/ glaciolacustrine unit. It is recommended this include, at a minimum, a five-foot long well set at the top of till at: BDA-12; BDA-13; near the upgradient side of the treatment zone; and possibly one in the middle of the treatment zone.

4. Section 5.2 – The system vents and the space around the treatment areas should be monitored regularly to determine if the system is producing air impacts above community air monitoring action levels. If action levels are exceeded, then corrective actions will be required.

5. Section 7 – The Operation, Maintenance and Monitoring (OMM) Plan must be approved prior to system startup. It is recommended the draft OMM Plan be submitted more than 6 weeks prior to the desired/anticipated startup date.

Approval of the work plan does not imply that the Department considers this technology the most appropriate remedial technology for this area. As noted by the Department in previous letters, there are contaminants of concern present in this area besides petroleum-related contaminants, which the proposed remedial technology may not address. If the IRM is not successful in adequately remediating all contaminants of concern for the targeted area, then additional remedial activities would be required; either as an additional IRM or as part of the site's overall remedy.

BMS must respond in writing within 15 days as to whether the modifications will be accepted. If accepted, BMS's acceptance letter and this letter must be attached to the front of all copies of the work plan and must be provided to the contractor(s) conducting the work. Please send the approved work plan, along with the modification letters, to the document repository and instruct the repository to replace any drafts of the work plan with the approved plan.

BMS must obtain and comply with any necessary State, local or federal permits.

The Department requires notification at least seven days in advance of field work

If you have any questions, please do not hesitate to contact me at 315-426-7411 or joshua.cook@dec.ny.gov.

Sincerely,



Joshua P. Cook, P.E.
Professional Engineer 1

ec: Gary Priscott (NYSDEC)
Joshua Cook (NYSDEC)
Scarlett McLaughlin (NYSDOH)
Sara Bogardus (NYSDOH)
John Hickey (BMS)
William Pufko (BMS)
Richard Mator (BMS)
Kirk Wolfgang (BMS)
Anne Locke (BMS)
William McCune (Arcadis)
Kevin Jay (Arcadis)

ARCADIS Design & Consultancy for natural and built assets

Bristol-Myers Squibb Company

BUILDING 55 AREA INTERIM REMEDIAL MEASURE WORK PLAN

Site #C734138

BMS Syracuse North Campus Restoration Area

East Syracuse, New York

May 2020; Revised March 2021



Kevin Jay, P.E.
Professional Engineer/Engineer of Record



William McCune
Principal Geologist

BUILDING 55 AREA INTERIM REMEDIAL MEASURE WORK PLAN

Site #C734138
BMS Syracuse North Campus
Restoration Area
3551 Burnet Avenue
East Syracuse, New York

Prepared for:

Bristol-Myers Squibb Company

Prepared by:

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017

Our Ref:

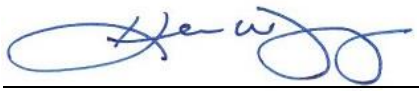
30049894

Date:

May 2020; Revised March 2021

CERTIFICATION STATEMENT

I, Kevin W. Jay, P.E., certify that I am currently a New York State registered Professional Engineer and that this Interim Remedial Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).



3/19/2021

Kevin W. Jay
Professional Engineer/Engineer of Record
NYS PE License No. 093165

Date



CONTENTS

Executive Summary ES-1

1 Introduction 1

1.1 Remedial Goals, Objectives, and Factors to Consider 1

1.2 Standards, Criteria, and Guidance 2

1.2.1 Chemical-Specific SCG 2

1.2.2 Action-Specific SCG 3

1.2.3 Location-Specific SCG 4

1.3 Site Description and Background 4

1.3.1 Geology/Hydrogeology 5

1.3.2 Building 55 Area Geology/Hydrogeology 6

1.3.3 Nature and Extent of Impacts 6

2 Pre-Design Investigation 8

2.1 Soil Boring Advancement and Field Characterization 8

2.2 Soil and Groundwater Sampling and Analysis 9

2.3 Summary of PDI Results 10

3 Basis of Design 12

3.1 TISR[SM] Technology Overview 12

3.2 Target Treatment Zone 12

3.3 Target Contaminants and Degradation Pathways 13

3.4 System Design Requirements 13

3.4.1 Target Treatment Temperature 13

3.4.2 BHE Wellfield Spacing and Construction Design 14

3.5 Pre-Construction Activities 15

3.5.1 Site-Specific Health and Safety Plan 15

3.5.2 Permitting 15

3.5.3 Underground Utility Locating 16

3.6 System Construction 16

3.6.1 Borehole Heat Exchanger Installation 16

3.6.2 Thermocouple Monitoring Point Installation 17

3.6.3 BHE Conveyance Lines and Thermocouple Conduits Installation 17
3.6.4 System Equipment Installation 19
3.6.4.1 Equipment Enclosure 19
3.6.4.2 Steam-to-Water Heat Exchanger 20
3.6.4.3 Heating System 20
3.6.4.4 System Controls 20
3.7 System Startup 21
3.8 Waste Management 21
4 Project Implementation Support 23
4.1 Pre-Construction Planning 23
4.2 Mobilization 23
4.3 Site Preparation 23
4.4 Project Meetings and Inspections 24
4.5 Survey Control 24
4.6 Site Security, Control, and Access 24
4.7 Dust, Vapor and Odor Monitoring and Mitigation 25
4.8 Erosion and Sediment Controls 26
5 System Operation, Maintenance, and Monitoring 27
5.1 Performance Monitoring 27
5.2 System Operation and Maintenance 29
6 Reporting 30
7 Schedule 31
8 References 32

TABLES (IN TEXT)

Table 1.1 Remedial Action Objectives 1
Table 1.2 Building 55 Area Stratigraphy 6
Table 5.1 TISR[SM] System Performance Monitoring Program 27
Table 5.2 Natural Attenuation Parameters 28
Table 7.0 Schedule 31

TABLES

Table 1	Pre-Design Investigation Field Activity Summary
Table 2A	Soil Analytical Results
Table 2B	Soil Analytical Results – TICs
Table 3A	Groundwater Analytical Results
Table 3B	Groundwater Analytical Results – TICs
Table 4	Potential for TISR to Enhanced COC Degradation Rates

FIGURES

Figure 1	Site Vicinity Map
Figure 2	Site Plan
Figure 3	Soil Boring Locations and Field Screening Results
Figure 4	Soil Analytical Results – VOC
Figure 5	Soil Analytical Results – SVOC and Aldehydes
Figure 6	Groundwater Analytical Results
Figure 7	Proposed Borehole Heat Exchanger, Thermocouple Monitoring Point, and Trenching/Piping Layout
Figure 8	Borehole Heat Exchanger and Borehole Heat Exchanger/Extraction Well Details
Figure 9	Thermocouple Monitoring Point Details
Figure 10	Manifold Details
Figure 11	Trench Cross Section Details
Figure 12	TISR^{SM} Enclosure Layout
Figure 13	Process and Instrumentation Diagram
Figure 14	Typical Electrical One Line
Figure 15	Miscellaneous Details

APPENDICES

Appendix A	Soil Boring Logs
Appendix B	Laboratory Analytical Reports and Data Usability Summary Reports

Appendix C Low Temperature Thermal Remediation (Horst et. el, 2018)

Appendix D Thermal Modeling Results

Appendix E Community Air Monitoring Plan

Appendix F Health and Safety Plan

Appendix G Quality Assurance Project Plan

EXECUTIVE SUMMARY

The remedy proposed in this Building 55 Area Interim Remedial Measure Work Plan (IRM Work Plan) consists of Thermal In-situ Sustainable Remediation (TISR^{SM}) with a contingency for periodic vacuum extraction events. The objective of this IRM Work Plan is to present plans for the design and implementation of interim remedial actions for the Building 55 Area that are:

- appropriate for site-specific conditions
- protective of public health and the environment
- consistent with Part 375 of Title 6 New York Codes, Rules, and Regulations (6 NYCRR) and Division of Environmental Remediation (DER) -10

The specific remedial objective of the IRM is to effectively implement reliable and cost-effective remedies for the Building 55 Area that achieve the remedial action objectives (RAO).

The BDA is an approximately 24-acre portion of the BMS facility located within a mixed industrial/residential urbanized area in East Syracuse, NY. Formerly utilized for the manufacture of active pharmaceutical ingredients, a site transformation project was implemented in the BDA, resulting in the demolition of numerous buildings and the conversion of much of the BDA to green space. The Building 55 Area is an area in which impacts have been observed in the subsurface around the former Building 55 Security Center.

The primary constituents of concern (COC) present in groundwater above criteria in the vicinity of former Building 55 are volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), dicyclohexylamine, and formaldehyde.

A pre-design investigation (PDI) was completed to further delineate the extent of impacts within the Building 55 Area. Information gathered during the PDI has been used to finalize the remedial design. The PDI activities included the advancement of 22 direct-push soil borings drilled to the top of the till unit.

While the PDI delineation effort primarily relied on the field screening observations, 18 soil samples and 8 grab groundwater samples were collected from select boring locations and submitted for laboratory analysis. Soil and groundwater samples, along with corresponding quality assurance/quality control samples, were submitted for laboratory analysis for VOC, SVOC, and aldehydes. The results of the PDI have provided a basis to refine the limits of the target area to be treated and update the thermal IRM system design.

The proposed remedial alternative for the Building 55 Area will involve the application of Arcadis' patented TISR^{SM} system. TISR^{SM} is a low-temperature in-situ thermal remediation technology that captures heat from the facility steam plant and transfers the heat to the subsurface using a closed loop system of conveyance piping and borehole heat exchangers (BHE). TISR^{SM} will increase overall subsurface temperatures to between 86°F to 104°F (30°C to 40°C) in the target treatment zone (TTZ) located approximately 10 to 15 feet (ft) below ground surface (bgs). The increased temperatures will enhance the natural attenuation processes which are anticipated to be the primary mechanism by which subsurface impacts will be addressed. It is estimated that in-situ treatment via TISR^{SM} will require approximately one and a half to three years to achieve the site RAO.

The proposed TISR[SM] system will consist of 30 BHE. The BHE will be installed at a spacing of approximate 20 ft. There will be 22 locations constructed as “BHE-only” and eight locations constructed as combined BHE/Extraction wells (EW). The eight BHE/EW are being installed as a potential contingency to allow vacuum extraction events to be performed to enhance the effectiveness of the remedial action if performance data indicates that TISR[SM] will not be able to obtain the remedial objectives within the 3-year time frame. Mobile vacuum extraction events may also be completed if dissolved phase concentrations (greater than 10 milligrams per liter [mg/L]) or light non-aqueous phase liquid (LNAPL) are detected during installation or operation of the TISR[SM] system.

The TISR[SM] equipment will be housed in an 8-foot by 12-foot shipping container. The major equipment will consist of a heat exchanger, a transfer pump, supply/return manifolds, heating/ventilation equipment, and electric and control panels. The heat exchanger will capture heat from the facility steam lines and transfer that heat to the TISR[SM] transfer fluid. The transfer fluid is a 50:50 mixture of deionized water and propylene glycol. The transfer pump will move the transfer fluid through a closed loop stainless steel tubing network to the BHE. Each BHE will consist of a stainless-steel tubing coil, wrapped around a carbon steel casing that is surrounded by a thermal conductive grout.

In addition to the BHE and BHE/EW, six thermocouple monitoring points (TMP) will be used to monitor subsurface temperatures and evaluate the BHE’s temperature radius of influence (ROI).

The system will be fully automated and designed to operate continuously with minimal operator oversight, reducing the need for on-site personnel to conduct routine inspections and periodic maintenance. The remedial system will be equipped with fail-safe devices to deactivate the operation in the event of an alarm condition. The system control panel will act as a fail-safe device to monitor and control system inputs and outputs. The system controls will be connected to an email server, which will notify designated personnel when there is a system alarm that requires response. The control panel will be a Programmable Logic Controller (PLC) with a human-machine interface (HMI) and cellular modem used for remote telemetry. The control panel will be capable of monitoring and recording data and controlling system functions.

System performance data will be displayed on the HMI. The system’s HMI will be capable of being monitored remotely using a web browser, smart phone application, or equivalent. The HMI will be capable of sending email and text (short message service) notifications to alert personnel of system alarms and status alerts. System monitoring instrumentation will consist of temperature transmitters, pressure transmitters, and flowrate transmitters with instantaneous output.

Monthly operation, maintenance, and monitoring (OMM) activities will include routine equipment maintenance, performance data measurements (temperature, pressure, and flow), and system adjustments. On a quarterly basis, groundwater samples will be collected from the BHE/EW and submitted for laboratory analyses. The data collected from the monthly activities and quarterly laboratory analyses will be used to optimize the system performance.

1 INTRODUCTION

This *Building 55 Area Interim Remedial Measure Work Plan* (IRM Work Plan) has been developed for the Bristol-Myers Squibb (BMS) Syracuse North Campus Restoration Area (also referred to as the Brownfield Development Area [BDA]), located at 3551 Burnet Avenue, East Syracuse, New York (**Figure 1**). The BDA is identified by the New York State Department of Environmental Conservation (NYSDEC) as Site No. C734138 and is subject to a Brownfield Cleanup Agreement (October 2011) between BMS and the NYSDEC. The remedy proposed in this IRM Work Plan consists of Thermal In-situ Sustainable Remediation (TISR^{SM}) with a contingency for vacuum extraction.

1.1 Remedial Goals, Objectives, and Factors to Consider

The objectives of this IRM Work Plan are to present plans for the design and implementation of interim remedial actions for the Building 55 Area (**Figure 2**) that are:

- appropriate for site-specific conditions
- protective of public health and the environment
- consistent with Part 375 of Title 6 New York Codes, Rules, and Regulations (6 NYCRR) and Division of Environmental Remediation (DER) -10 Technical Guidance for Site Investigation and Remediation (NYSDEC 2010b)

The specific remedial objective of the IRM is to effectively implement reliable and cost-effective remedies for the Building 55 Area that achieve the remedial action objectives (RAO) presented below.

Table 1.1 Remedial Action Objectives

RAO for Soil
RAO for Public Health Protection 1. Prevent ingestion/direct contact with contaminated soil. 2. Prevent inhalation exposure to contaminants volatilizing from soil. *RAO for Environmental Protection* 1. Prevent migration of contaminants that would result in groundwater contamination. 2. Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.
RAO for Groundwater
RAO for Public Health Protection 1. Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards. 2. Prevent contact with, or inhalation of volatiles, from contaminated groundwater. *RAO for Environmental Protection* 1. Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable. 2. Remove the source of ground or surface water contamination

Additional factors considered in connection with the design and implementation of this IRM include the following:

- Underground and overhead utilities in proximity to the area to be remediated and identified during the pre-design investigation (PDI) were considered in the remedial design process to ensure they are not adversely impacted.
- Steam from the plant boilers will be used as the energy source to supply heat to raise the temperature of the subsurface. Appropriate safety aspects have been considered during design and will continue to be considered throughout construction and operation of the system to ensure remedial system technician workers, BMS staff, and site visitors are not injured as a result of unplanned high-temperature steam or fluid discharge.

1.2 Standards, Criteria, and Guidance

Standards, criteria, and guidance values (SCG) are defined in 6 NYCRR Part 375-1.8(f)(2). The SCG identified for the remedy proposed in this IRM Work Plan are presented in the following subsections. These SCG have been identified as potentially applicable; their actual applicability will be determined during the final design and implementation phase.

1.2.1 Chemical-Specific SCG

The potential chemical-specific SCG are summarized below. Chemical-specific SCG are the criteria that will drive remedial efforts at the site because they are most directly associated with addressing potential human exposure.

- NYSDEC CP-51/Soil Cleanup Guidance, Table 1 Supplemental Soil Cleanup Objectives (SCO) (NYSDEC 2010b), and 6 NYCRR Subpart 375-6.8 (a) and (b), including the protection for public health commercial use SCO and the protection of groundwater SCO. The protection for public health commercial use SCO is selected for the BDA because any future land use will be restricted to commercial/industrial purposes only.
- Groundwater standards and guidance values provided in NYSDEC TOGS 1.1.1 Part 1 (B) 1 and Part 1 (B) 2, Steps 1 through 3 (NYSDEC 1998 to 2009). As discussed in the Remedial Investigation Report (Arcadis 2019), a default screening value of 50 micrograms per liter (µg/L) is used for dicyclohexylamine, methyl isobutyl ketone, and triethylamine.
- The Resource Conservation and Recovery Act (RCRA) and New York State regulations regarding identifying and listing hazardous wastes outlined in Title 40 of the Code of Federal Regulations (40 CFR) Part 261 and 6 NYCRR Part 371, respectively. These regulations may also apply to waste materials generated during remediation. Included in these regulations are the regulated levels for the Toxicity Characteristic Leaching Procedure (TCLP) constituents. The TCLP constituent levels are a set of numerical criteria at which solid waste is considered to be a hazardous waste by the characteristic of toxicity. In addition, the hazardous characteristics of ignitability, reactivity, and corrosivity may also apply, depending on the results of waste characterization activities.
- The United States Environmental Protection Agency (USEPA) Universal Treatment Standards/Land Disposal Restrictions (UTS/LDR), as listed in 40 CFR Part 268. These standards and restrictions may

also apply to any hazardous waste materials generated during remediation, and they identify hazardous wastes for which land disposal is restricted and define acceptable treatment technologies or concentration limits that may apply prior to land disposal. Land Disposal Restrictions, as listed in 6 NYCRR Part 376, may also apply.

1.2.2 Action-Specific SCG

Action-specific SCG include general health and safety requirements and general requirements regarding handling and disposal of waste materials (including transportation and disposal, permitting, manifesting, disposal, and treatment facilities), discharge of water generated during implementation of remedial alternatives, and air monitoring requirements (including permitting requirements for on-site treatment systems). Several action-specific SCG that may be applicable during remediation of this area are briefly summarized below.

- The NYSDEC Division of Air Resources (DAR) policy document DAR-1: Guidelines for the Evaluation and Control of Ambient Air Contaminants Under Part 212 (formerly issued as Air Guide 1) (NYSDEC 2016a) incorporates applicable federal and New York State regulations and requirements pertaining to air emissions, which may be applicable for soil or groundwater alternatives that result in certain air emissions. Community air monitoring would be required in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP, Appendix 1A of DER-10). New York Air Quality Standards provide requirements for air emissions (6 NYCRR Part 257). Emissions from remedial activities will meet the air quality standards based on the New York State Air Quality Classification System (6 NYCRR Part 256) and the permit requirements in New York Permits and Certificates (6 NYCRR Part 201). The general provisions (6 NYCRR Part 200) and the provision regarding Process Operations (6 NYCRR Part 212) may also apply.
- The New York State solid waste management regulations presented in 6 NYCRR Parts 360-365 may be applicable to alternatives that include the disposal of impacted soil.
- The New York State hazardous waste management regulations presented in 6 NYCRR Parts 370-374 and 376 may be applicable to alternatives that include the disposal of impacted soil. LDR that regulate the disposal of hazardous wastes may also be applicable to alternatives involving the disposal of hazardous waste (if any).
- The United States Department of Transportation (USDOT) and New York State rules for the transport of hazardous materials are provided in 49 CFR Parts 107 and 171.1 through 172.558 and 6 NYCRR 372.3, respectively. These rules include procedures for packaging, labeling, manifesting, and transporting hazardous materials. New York State requirements for waste transporter permits are included in 6 NYCRR Part 364, along with standards for collection, transport, and delivery of regulated wastes within New York State.
- Section 404 of the Clean Water Act (CWA) establishes site-specific pollutant limitations and performance standards that are designed to protect surface water quality, and Section 401 of the CWA requires a 401 Water Quality Certification permit be obtained for those activities that may result in a discharge to waters of the United States. The Classes and Standards of Quality and Purity may apply as established under NYCRR Parts 700-703. The National Pollutant Discharge Elimination

System (NPDES) program is also administered in New York by the NYSDEC as a State Pollutant Discharge Elimination System (SPDES) as defined in 6 NYCRR Part 750.

- Remedial alternatives must comply with applicable requirements outlined under the Occupational Safety and Health Administration (OSHA). General industry standards are outlined under OSHA (29 CFR 1910) that specify time-weighted average concentrations for worker exposure to various compounds and training requirements for workers involved with hazardous waste operations. The types of safety equipment and procedures to be followed during remediation are specified under 29 CFR 1926, and recordkeeping and reporting requirements are outlined under 29 CFR 1904.
- In addition to OSHA requirements, the RCRA (40 CFR 264) preparedness and prevention procedures, contingency plan, and emergency procedures are potentially relevant and appropriate to those remedial alternatives that include generation, treatment, or storage of hazardous wastes.

1.2.3 Location-Specific SCG

Examples of potential location-specific SCG include regulations and federal acts concerning activities conducted in floodplains and historical areas and activities affecting navigable waters and endangered/threatened or rare species. None of these should apply for the remedial alternatives considered for the Building 55 source area. Other location-specific SCG that may apply are local requirements, such as local building permit conditions for permanent or semi-permanent facilities constructed during the remedial activities (if any), influent/pre-treatment requirements for discharging water to the POTW, and local pollution requirements (e.g., air and noise).

1.3 Site Description and Background

The BDA is an approximately 24-acre portion of the BMS facility located within a mixed industrial/residential urban area in East Syracuse, NY (**Figure 1**). Formerly utilized for the manufacture of active pharmaceutical ingredients, a transformation project was implemented in the BDA, resulting in the demolition of numerous buildings and the conversion of much of the BDA to green space. Former and existing site features are shown on **Figure 2**.

The topography of the site slopes downward to the east-northeast, from Thompson Road toward the local valley, which is drained by the South Branch of Ley Creek (referred to herein as Ley Creek), located approximately 450 ft east of the BDA. Ley Creek originates to the southeast of the site running through industrial and commercial properties, runs along the eastern perimeter of the BMS operating facility, passes through a culvert beneath the adjacent CSX railroad tracks, and continues to the northwest.

The majority of buildings in the BDA have been decommissioned and demolished as part of the BMS Syracuse Facilities Transformation Program to develop a “penicillin-free” biologic drug substance manufacturing facility.

The Building 55 Area includes the area surrounding the former underground storage tank (UST) east of the former Building 55 Security Center location (**Figure 2**). There are currently no buildings within this area. However, an above grade pipe rack and a number of subsurface utilities cross the area. The ground surface within the limits of this area principally consists of landscaped lawns, concrete sidewalks and an asphalt parking lot.

The primary impacts that have been observed in the subsurface around the former Building 55 Security Center include hydrocarbons assumed to be associated with the former Diesel UST, DS-55, which was installed in 1982 adjacent to the Building 55 Security Center. The available information on the identification of the failure and closure of this UST was documented in the *Remedial Investigation Work Plan* (OBG 2013). In October 1986, water was detected in the diesel fuel drawn from DS-55, and inspection of the UST indicated the tank had failed. In response, DS-55 was excavated and removed. Inspection indicated the UST was pitted with some holes. NYSDEC was notified of the tank failure and inspected the excavated area. Impacted soil was excavated and disposed off-site, and the excavation backfilled. Hydrocarbon impacts within the subsurface have subsequently been observed and the area around the former Building 55 determined to require remediation.

1.3.1 Geology/Hydrogeology

The BDA has three overburden units: (1) fill; (2) glaciolacustrine deposits; and (3) till. The uppermost unit (fill) most frequently consists of brown gravel with varying amounts of concrete debris, sand, silt, and clay, with occasional wood, asphalt, cinders, ash, and brick. The glaciolacustrine unit is inferred to have been deposited in a glacial lake that occupied the valley after ice receded from the area based on its composition of laminated, brown-to-gray, medium-to-fine grained sands, silts, and clays. The till unit is composed of very dense, red-brown silt with gravel, sand, and clay in varying proportions.

A layer of weathered bedrock is situated between the till and competent bedrock. The weathered bedrock consists of intervals of dark green grey, very dense silty clay containing angular pieces of shale and intervals of more competent shale ranging up to several feet in thickness. The competent bedrock consists of sparsely fractured shale with relatively frequent thin beds and veins of selenite (gypsum) and occasional thin beds inferred to be dolomite.

Groundwater occurs in the overburden at depths from approximately 5 to 12 feet (ft) below ground surface (bgs) across this area of the BDA. Groundwater in each layer moves east-northeast, in the direction of Ley Creek (toward the valley). Groundwater flow in the overburden is interpreted to be principally horizontal due to the lower hydraulic conductivity of underlying units. However, a downward hydraulic gradient exists through the till to the bedrock across most of the site. Lateral hydraulic gradients are steeper in the western portion of the site, along the valley wall, averaging approximately 0.07 foot per foot. Beneath the valley floor, lateral hydraulic gradients decrease to approximately 0.03 foot per foot. Groundwater movement in the weathered and competent bedrock is focused along discrete, interconnected zones of relatively higher hydraulic conductivity associated with relict fractures in weathered bedrock and transmissive fractures in competent bedrock. Ley Creek is the groundwater discharge boundary for the bedrock and overlying geologic units at the site.

Water levels at the well cluster locations containing wells screened in both weathered bedrock and competent bedrock units are typically observed at least several feet higher in the weathered bedrock than the underlying competent bedrock. This suggests that hydraulic communication between the weathered and competent bedrock is relatively poor. Groundwater movement through the competent bedrock is inferred to occur along widely spaced, bedding-plane (i.e., near-horizontal) fractures that are hydraulically connected in varying degrees by vertical joints.

Groundwater yield in the till, weathered bedrock, and competent bedrock is low, and in some cases de minimis. Packer testing conducted during bedrock coring indicated flow rates frequently less than 0.03

gallon per minute (gpm), with several test intervals indicating no measurable groundwater flow, and a maximum observed flow rate of approximately 0.06 gpm.

1.3.2 Building 55 Area Geology/Hydrogeology

Table 1.2 summarizes stratigraphy in the Building 55 Area and the range in hydraulic conductivity values observed within each of these lithologic units.

Table 1.2 Building 55 Area Stratigraphy

Lithologic Unit	Description	Thickness (feet)	Hydraulic Conductivity (feet per day)
Fill	Gravel with variable debris, sand, silt, and clay	3 to 7	Range: 0.12 to 27 Geometric Mean: 1.1
Glaciolacustrine	Laminated, medium-to-fine grained sands, silts, and clays	10 to 15	Range: 0.15 to 17 Geometric Mean: 1.5
Till	Very dense silt with variable gravel, sand, and clay	39 to 42	Range: <0.025 to <6.7 Geometric Mean: <0.14
Weathered Bedrock	Very dense silty clay with angular pieces of shale and intervals of competent shale several feet thick	14 to 20	Range: 0.037 to 13 Geometric Mean: 0.32
Competent Bedrock	Vernon Shale – Sparsely fractured shale with thin beds and veins of selenite (gypsum) and dolomite	NA	Range: <0.034 to <0.97 Geometric Mean: <0.16

The hydraulic gradient in the Building 55 Area is to the east-northeast, toward Ley Creek. The water table in the Building 55 Area occurs in the overburden typically between 4 and 7 ft bgs near the fill/glaciolacustrine interface and is recharged principally by infiltration of precipitation on and upgradient of the area. Groundwater flow in the overburden is principally horizontal due to the lower hydraulic conductivity of underlying units. Site monitoring data indicate that both the till and bedrock units beneath the Building 55 Area have very low permeability and low groundwater production rates.

The hydraulic conductivity values presented in the table above are general site-wide estimates and are not specific to Building 55 Area. These estimates are primarily based on drawdown observed in monitoring wells during low-flow sampling. A subset of monitoring wells screened in the till and competent bedrock did not achieve steady state drawdown during sampling or had insufficient recharge for low-flow sampling. Therefore, the actual hydraulic conductivity of these units is considerably lower than the calculated geometric mean values presented.

1.3.3 Nature and Extent of Impacts

Impacts to soil and groundwater in the former Building 55 Area have been identified through the installation of soil borings (B55-3 through B55-6) and monitoring wells (B55-1, B55-2, and the BDA-14 cluster) during the Phase 1/1A and Phase 2 investigation programs (**Figure 3**). Soil and groundwater analytical results, visual observations, and photoionization detector (PID) field screening results have all been used to determine the presence and relative extent of impacts.

Laboratory analytical results revealed that volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), dicyclohexylamine, and formaldehyde are present in groundwater above criteria in the vicinity of former Building 55. Additionally, elevated PID readings and petroleum-like odors were

detected in subsurface soils at boring locations B55-2, B55-3, and B55-4. The highest PID reading (3,358 parts per million [ppm]) was observed at boring location B55-3 at a depth of approximately 10 ft bgs.

Based on the above observations, the impacts in the Building 55 Area are in the immediate vicinity of the former building and extend east-northeast toward former Buildings 20 and 20A, and the adjacent parking lot. The absence of hydrocarbon impacts above criteria in downgradient monitoring points including the BDA-12 cluster, BDA-13WT, and former well locations BCP-B20-002, BCP-B20-003, and BLD20-1 suggest that the lateral extent of impacts is limited. Although the available data provide a general understanding of impacts in this area, a more detailed delineation of the distribution of the impacts was needed to facilitate the design of an effective remedial approach. Therefore, additional PDI activities were implemented by Arcadis, as detailed in the following section.

2 PRE-DESIGN INVESTIGATION

This section summarizes the scope of supplemental data collection and analysis implemented in accordance with the PDI Work Plan for the Building 55 Area (Arcadis 2020) as modified by the NYSDEC approval letter dated September 10, 2020. This section also presents the results of the PDI.

The PDI drilling and sampling activities were implemented between November 9 and 18, 2020 using the methods described in the *Field Sampling and Analysis Plan* (FSAP) and the CAMP approved by the NYSDEC as Appendices A and D of the *Remedial Investigation Work Plan* (OBG 2013). The investigation was also completed following the guidance in DER-10 Section 3.5.1(d) and Appendix 2A. The objective of this work was to further assess the impacts identified in proximity to the former Building 55 Area and support finalizing the IRM design presented in this IRM Work Plan.

2.1 Soil Boring Advancement and Field Characterization

Arcadis advanced a total of 22 soil borings (B55-PDI-SB-1 through B55-PDI-SB-22) using a track-mounted direct-push drill rig in the vicinity of the former Building 55 UST (**Figure 3**). Soil samples were collected continuously at each boring location from grade to the total depth of the boring using a 2-inch-diameter steel sampling barrel containing a disposable liner. Encountered soils were visually characterized for color, texture, moisture content, and obvious impacts and headspace-screened with a PID, equipped with an 11.7 electron volt lamp, to determine the relative concentration of volatile organic vapors in the sample. **Table 1** (PDI Field Activity Summary) presents field observations recorded from each boring installed during the investigation including drilling date, boring depth, depth to till, highest PID reading, depth to highest PID reading, observations of potential impacts, other observations/notes, soil sample intervals selected for analysis, and boring at which temporary piezometers were installed for collection of grab groundwater samples. Boring locations are depicted on **Figure 3** along with field screening results. Detailed logs of each soil boring are included in **Appendix A**.

The first borings (B55-PDI-SB-1, B55-PDI-SB-2, and B55-PDI-SB-4) were installed in the immediate area of the former UST and then additional borings were advanced to the north, east, south, and west to define the vertical and horizontal extent of impacts. Field PID screening values of less than 250 ppm in the subsurface soil encountered in each soil boring were used as an indication horizontal extent of impacts had been adequately delineated in all directions. Twenty (20) of the 22 soil borings were advanced into the top of the glacial till unit, encountered between 12.4 and 20.1 ft bgs across the investigation area. Only borings B55-PDI-SB-9 (4.0 ft bgs) and B55-PDI-SB-20 (14.0 ft bgs) encountered refusal prior to reaching the till unit. Multiple attempts were advanced at each of the two borings but were unsuccessful advancing beyond the referenced depths. The remaining soil borings ranged in depth between 14 and 22.5 ft bgs. Measurable occurrence of LNAPL was not observed at any of the soil boring locations.

Upon completion of the soil borings temporary piezometers were installed in nine locations to collect a grab groundwater sample for laboratory analysis. However, insufficient water to collect a sample was encountered in the borehole at B55-PDI-SB-01. Boreholes were backfilled with bentonite chips following soil and groundwater sample collection and removal of the temporary piezometers. The surface at each location were restored to match the surrounding area.

2.2 Soil and Groundwater Sampling and Analysis

The primary intent of the soil borings was to further delineate the extent of fuel oil-related hydrocarbon impacts based on the field characterization and screening of the collected soil samples. To facilitate calibration of field observations to actual field conditions and improve estimation of time required to achieve the remedial objectives, 18 soil samples and 8 grab groundwater samples were collected from boring locations and submitted for laboratory analysis.

Six soil samples, listed below, were selected from intervals with the highest levels of impact based on screening and field observations.

- B55-PDI-SB-1 (8-10')
- B55-PDI-SB-2 (10-12')
- B55-PDI-SB-10 (9-10')
- B55-PDI-SB-11 (5-6')
- B55-PDI-SB-13 (6-8')
- B55-PDI-SB-17 (8-9')

Three soil samples, listed below, were selected for analysis from depth intervals below the apparent depth of highest impacts to facilitate calibration of screening results to conditions reflecting vertical attenuation of impacts.

- B55-PDI-SB-17 (9-10')
- B55-PDI-SB-18 (10.7-11.7')
- B55-PDI-SB-19 (12.6-13.2')

Two soil samples, listed below, were collected from the interval immediately above the till at locations with high levels of impact based on screening and field observations.

- B55-PDI-SB-1 (16-16.9')
- B55-PDI-SB-13 (12-12.5')

Seven soil samples, listed below, were also collected from the northern, eastern, southern, and western most borings to support the horizontal delineation of the impacts.

- B55-PDI-SB-6 (12-13')
- B55-PDI-SB-7 (13-14')
- B55-PDI-SB-15 (8-9')
- B55-PDI-SB-18 (9.5-10.5')
- B55-PDI-SB-19 (11.6-12.6')
- B55-PDI-SB-21 (4.5-5.5')
- B55-PDI-SB-22 (5.2-6.2')

Visual and olfactory observations made during the investigation ranged from "no obvious impacts" at borings B55-PDI-SB-9, B55-PDI-SB-16 and B55-PDI-SB-20 to "black staining, degraded petroleum-like odor, and sheen" at location B55-PDI-SB-1. Other observations included a "pale red-purple discoloration" from 9.4 to 9.5 ft bgs at boring location B55-PDI-SB-4. The highest PID readings at each boring location ranged between non-detect (0.0 ppm) and >2,000 ppm.

Grab groundwater samples were collected from temporary 1-inch PVC piezometers installed at the boring locations listed below.

- B55-PDI-SB-3
- B55-PDI-SB-4
- B55-PDI-SB-5
- B55-PDI-SB-7
- B55-PDI-SB-15
- B55-PDI-SB-16
- B55-PDI-SB-18
- B55-PDI-SB-21

A piezometer was also installed at location B55-PDI-SB-1. However, no sample was collected due to the lack of sufficient groundwater recharge to the piezometer.

Soil and groundwater samples, along with corresponding quality control samples (QC), were submitted to Eurofins Lancaster Environmental Laboratory for VOC analysis in accordance with USEPA SW-846 Method 8260C, SVOC analysis in accordance with USEPA SW-846 Method 8270C, and aldehydes analysis in accordance with USEPA SW-846 Method 8315A. The laboratory analyses of the environmental samples and the associated QC samples were performed in accordance with the NYSDEC-approved Quality Assurance Project Plan (QAPP; Appendix B of the Remedial Investigation Work Plan [OBG 2013]) as modified by an addendum incorporated as Appendix C of the Groundwater PDI and Supplemental Sampling Work Plan (Arcadis 2018) that was approved by NYSDEC on September 18, 2018. Laboratory data deliverables comply with DER-10, Appendix 2B. The data were validated and added to the project database.

Each boring location was surveyed by Arcadis to the nearest 0.01 foot, and the elevation was determined relative to North American Vertical Datum of 1988 and North American Datum of 1983.

2.3 Summary of PDI Results

The analytical results of the soil samples are summarized on **Tables 2A and 2B**. These results have been compared to applicable NYSDEC SCO. The distribution of analytical detections in the soil samples are illustrated on **Figure 4** (VOC) and **Figure 5** (SVOC and Aldehydes). The only exceedance of a NYSDEC Commercial SCO was 240 D milligrams/kilogram (mg/kg) 1,2,4 trimethylbenzene detected in the soil sample from the 8-10 ft sampling interval in soil boring B55-PDI-SB-01. Five additional VOC (1,3,5 trimethylbenzene, ethylbenzene, isopropylbenzene, naphthalene, and xylenes) were also detected in this soil sample at concentrations above SCO for the protection of groundwater. Three VOC (1,2,4 trimethylbenzene, acetone, and isopropylbenzene) were also detected above SCO for the protection of groundwater in four other soil samples.

The analytical results of the grab groundwater samples are summarized on **Tables 3A and 3B**. These results have been compared to applicable NYSDEC TOGS 1.1.1 criteria. The distribution of analytical detections in the groundwater samples are illustrated on **Figure 6**. The groundwater sample from B55-PDI-SB-04 contained 14 VOC and 10 SVOC detections at concentrations exceeding the TOGS 1.1.1 criteria including 1,2,4 trimethylbenzene, 1,3,5 trimethylbenzene, ethylbenzene, xylenes, naphthalene, and dicyclohexylamine. This sample was also the only location where formaldehyde was detected above

criteria. Groundwater criteria were also exceeded in samples from B55-PDI-SB-05, B55-PDI-SB-07, B55-PDI-SB-15, B55-PDI-SB-16, B55-PDI-SB-18, and B55-PDI-SB-21.

The laboratory analytical reports and data usability summary reports are presented in **Appendix B**.

3 BASIS OF DESIGN

This section describes the scope, extent, and preliminary design parameters. As documented in Section 1, the primary IRM component is TISR^{SM}.

3.1 TISR^{SM} Technology Overview

Arcadis' patented TISR^{SM} is a low-temperature in-situ thermal remediation technology that involves heating subsurface media to enhance biodegradation, hydrolysis, and/or volatilization of COC in-situ within the saturated and capillary zones. TISR^{SM} typically involves circulating a heat transfer fluid (e.g., propylene glycol) through a closed-loop piping system and subsurface borehole heat exchangers (BHE). Solar collectors that capture solar heat or heat exchange units that obtain heat from waste heat sources (e.g., radiant heat from blower motors, excess heat from site steam, etc.) are used to raise the temperature of the heat transfer fluid.

Factors considered for selecting TISR^{SM} as an IRM for addressing the subsurface impacts identified in the Building 55 Area include:

- Appropriate for the site-specific conditions; low permeability of the geologic layer where site-related impacts have been primarily identified.
- Protective of public health and the environment.
- Compliant with soil cleanup goals identified in the RAO presented above.
- Technology implementation is consistent with sustainable remediation practices; lower carbon footprint compared to other alternatives.
- Relatively low capital and operation & maintenance costs.

For the Building 55 Area IRM, the proposed TISR^{SM} system will utilize steam from the BMS Boiler House and a heat exchanger to heat the transfer fluid that will ultimately increase the temperature in the subsurface. As observed at multiple locations within the Fort Drum facility utilizing TISR^{SM} in New York, it is anticipated that subsurface temperatures will increase in the target treatment zone (TTZ) anywhere between 86°F (30°C) and 104°F (40°C). Subsurface temperatures immediately adjacent to the BHE will be higher. Increased temperatures typically enhance the natural attenuation processes (Horst et al. 2018). These enhanced processes are anticipated to be the primary mechanisms by which subsurface impacts will be addressed, although other remedial mechanisms resulting from the increase in subsurface temperature (desorption/solubility, volatilization, and hydrolysis) are anticipated to occur and further enhance treatment and reduce cleanup times. A copy of the above referenced citation is provided as **Appendix C**.

3.2 Target Treatment Zone

Subsurface impacts are generally located in the immediate vicinity of the former Building 55 and extend east-northeast toward former Buildings 20 and 20A, and the adjacent parking lot. Impacts have been observed at the base of the fill (i.e., at 9 to 15 ft bgs) in a silty-sand lithology zone that is saturated.

The TTZ will consist of an approximately 8,100 square foot area and an approximately 9 to 15 ft bgs target treatment depth. The TTZ dimensions (area and depth interval) are based on the results of the PDI.

3.3 Target Contaminants and Degradation Pathways

The COC within the TTZ were evaluated to determine the degradation pathways and aid in predicting the effectiveness of the TISR[SM] technology. It is anticipated that the aerobic (biodegradation) pathway will be the primary means of COC remediation and while a few compounds may undergo abiotic hydrolysis, it is not expected to be the primary pathway. Table 4 provides a list of the target compounds, the expected pathway of degradation, the relative compiled literature degradation rates under ambient conditions, as well as any pertinent comments related to the compound or pathway.

Some compounds have shown to be less amenable to biodegradation and the effect of temperature on biodegradation rates of these compounds is not generally known. Overall, the introduction of heat will increase the biodegradation rates of all compounds, but it is unknown if the increase will provide sufficient remediation within a reasonable timeframe. Some of the COC with below average biodegradation rates in ambient conditions are currently at low concentrations within the groundwater and have minimal or non-detect concentrations within the soil.

In addition to the degradation pathways presented within the table, the Henry's Law Constant and subsequently the volatilization rate of the compounds will also increase with the increase in temperature. The headspace concentrations of surrounding monitoring wells will be evaluated during system operation to ensure vapor intrusion or ambient vapors are not a concern during system operation. Should any vapors migrate near the surface, the majority of the compounds would be expected to readily photolyze.

3.4 System Design Requirements

The rationale for the TISR[SM] system design and remedial approach is provided below, including the treatment target temperature range, the wellfield layout, and materials selected for construction.

3.4.1 Target Treatment Temperature

TISR[SM] is a relatively inexpensive and environmentally friendly in-situ remedial alternative that involves increasing subsurface temperatures to address environmental impacts by enhancing natural degradation processes. The effect of temperature on the biodegradation rates of several chemical constituents are well documented. Generally, an increase in temperatures results in an increase in biodegradation rates. For example, the biodegradation rates of petroleum hydrocarbons, such as toluene, ethylbenzene, and xylene, have been observed to increase threefold with an increase in temperature from 10°C to 20°C (Margesin and Schinner 2001). Additionally, numerous studies have also determined that approximately 86°F (30°C) up to approximately 104°F (40°C) is the optimal range for this temperature-degradation rate dependency (Xu 1997, Daniel et al. 2000). Temperatures above 104°F (40°C) result in less optimal conditions because of the denaturalization of proteins, enzymes, and nucleic acids required for biodegradation and therefore, degradation rates decrease (Yadav et al. 2012). Therefore, as indicated in Section 3.1, temperatures ranging from approximately 86°F (30°C) up to approximately 104°F (40°C) have been selected as the typical target temperature range to optimize the overall natural attenuation degradation reaction and to reduce cleanup times.

In addition to the effects of temperature on biodegradation, the effects of temperature on the chemical properties of several COC are also well documented, including but not limited to:

- Increase in the solubility of higher molecular weight COC, which would facilitate their degradation or recovery via vacuum extraction events (Stephen and Stephen 1963; Knauss et al. 2000; Peters et al. 2002; Fischer et al. 2004; Horst et al. 2018).
- Increase dissolved phase/vapor phase partitioning (i.e., increase in Henry's law constant) of higher molecular weight COC (Shukla and Hicks 1984; Horst et al. 2018), which would enhance the natural attenuation reactions and other remedial efforts.
- Increase hydrolysis rates (Jeffers et al. 1989; Washington 1995; Jeffers and Wolfe 1996; Horst et al. 2018), which can contribute to contaminant degradation.

Although biodegradation is the primary mechanism by which site impacts are anticipated to be addressed, changes in the chemical properties of site COC (resulting from the increase in subsurface temperature) are anticipated to further enhance treatment and reduce cleanup times.

3.4.2 BHE Wellfield Spacing and Construction Design

Two finite element thermal models were developed using FlexPDE® (Version 7) to support the development of the TISR℠ system design, including:

- A three-dimensional (3-D) model developed to simulate the heat transport performance of different BHE wellfield layouts to support the development of an optimal BHE wellfield spacing.
- A two-dimensional (2-D) model developed to simulate the heat transport efficiency of different construction materials to support the development of an optimal BHE construction design.

The 3-D model domain consisted of an area of approximately 8,100 square feet (750 square meters). The model domain extended vertically from grade to a depth of approximately 164 ft (50 meters [m]). Based on the observed geology of the target treatment area, the model geologic layers consisted of fill (0 - 8 ft [0 - 2.4 m]); fine sand, silt, and clay (8 - 18 ft [2.4 - 5.5 m]); till (18 - 55 ft [5.5 - 16.9 m]); weathered bedrock (55 - 61 ft [16.9 - 18.6 m]); and bedrock (shale) (>61 ft [>18.6 m]). Additionally, the water level was assumed to be present at approximately 5 ft bgs.

For the purposes of this modeling effort, the BHE were modeled in the (saturated) fine sand, silt, and clay unit. The influent temperature in the BHE was an assumed temperature of approximately 270°F (130°C) based on the existing Boiler House steam operating temperatures and the observed temperature at a building near the Building 55 Area. All heating energy was assumed to be applied to the aquifer equally along the vertical extent of the BHE. Groundwater flow was not included as a component of the model due to the estimated groundwater velocities reported for the fill/glaciolacustrine lithologies, which range from 0.3 to 3.0 feet per day. The soils within the Building 55 area are finer in nature and result in a limited groundwater flow velocity. Therefore, the loss of heat to groundwater flow is not anticipated to have a significant effect on the ability to achieve optimal temperatures. Several BHE spacing configurations were modelled including, 20 ft (6 m), 26 ft (8 m), and 36 ft (12 m). The assumed target temperature was approximately 104°F (40°C) (halfway between BHE) and the time frame to reach the target temperature was approximately three months (90 days). The thermal properties used in the 3-D model (i.e., thermal diffusivity, thermal distribution coefficient, specific heat capacity) are discussed in **Appendix D**.

Based on the 3-D thermal modelling results, a BHE spacing of approximately 20 ft (6 m) was selected for the wellfield layout. Based on this configuration and on the modelled parameters, the target temperature of 104°F (40°C) would be achieved in approximately 92 days. The modeling was updated consistent with the preferred spacing and the anticipated wellfield consisting of 30 BHEs to confirm the preliminary results. Note that once operational, the system will be monitored, and steam flowrates adjusted to control the amount of heat transferred and maintain the desired temperature ranges between the BHE.

The 2-D model consisted of a horizontal cross section of a single BHE. Like the 3-D model, the BHE in the 2-D model was modeled in the (saturated) fine sand, silt, and clay unit. Additionally, the influent temperature in the BHE was an assumed temperature of approximately 270°F (130°C). The thermal properties used in the 2-D model (i.e., thermal diffusivity, thermal distribution coefficient, specific heat capacity) were also obtained from literature. Several BHE casing diameters and construction materials were modeled, including:

- Coil Material: copper vs. stainless steel.
- Annulus fill materials: silica sand vs. thermal grout.
- BHE casing diameter: 2 vs. 4 vs. 6-inch outside diameter (OD).

Considering the BHE spacing, the heat available, the target temperature, and that the remedial activities are expected to be completed within three years, the 2-D modeling results indicated that the BHE coil material, annulus fill material, and BHE casing diameter had little influence on the heat transfer effectiveness. The modeling showed that the different configurations obtained the target temperature and distances within a few days of each other. Therefore, the BHE will be constructed of stainless steel, thermal grout will be used to fill the annulus and have a coil diameter of 4 inches.

Additional thermal modelling details are included in **Appendix D**.

3.5 Pre-Construction Activities

Pre-construction activities are summarized below, including revising the existing Health and Safety Plan (HASP), permitting, and location and mark out of utilities and potential obstructions within the area.

3.5.1 Site-Specific Health and Safety Plan

The existing site HASP will be updated prior to commencing the field work and will address the specific activities associated with the construction of the TISR^{SM} system. The HASP will summarize the health and safety protocols to be followed by field personnel during all field activities.

3.5.2 Permitting

Any required permits for system construction and operation will be obtained prior to system installation, start-up, and/or operation. Proposed installation activities will be performed under the oversight of a New York Professional Engineer or a person under their supervision or responsible charge.

3.5.3 Underground Utility Locating

Arcadis will follow the established BMS utility location and clearance procedures prior to initiating subsurface activities including application of a utility locator using electromagnetic and ground-penetrating radar techniques to identify and mark out the approximate location of subsurface utilities near/adjacent to the location of the TISR^{SM} system project area. The trenching and BHE location will be adjusted if the utility locator information is different than the existing and available subsurface utility information. BMS will issue an excavation permit to Arcadis prior to initiation of excavation activities.

3.6 System Construction

This section presents a task-by-task summary of the construction activities to be completed to install the TISR^{SM} system.

3.6.1 Borehole Heat Exchanger Installation

As shown on **Figure 7**, the revised IRM design based on the PDI results includes a total of 30 BHE installed at a 20-foot spacing to a depth of approximately 15 ft bgs; 22 BHE to be constructed as "BHE-only" locations and the remaining eight BHE to be constructed as combined BHE/Extraction wells (EW). **Figure 8** provides typical construction details for each type of BHE. The heating interval for each BHE will be installed from approximately 10 to 15 ft bgs.

At a minimum, the upper five feet of the soil borings will be cleared using air knife/vacuum technologies (or other appropriate methods) to confirm that no utilities and/or obstructions are present at the proposed BHE locations. The soil borings will then be advanced using 8-inch inner diameter hollow-stem auger (HSA) techniques. Soil recovered from each soil boring will be field screened for the presence of organic vapors using a PID and will be visually characterized for lithology, color, texture, and moisture content. The presence of visible staining, sheen, LNAPL, and obvious odors encountered in the soil (if any) will also be documented.

The heating interval of each BHE will be constructed using a 4-inch diameter carbon steel casing with ¾-inch OD stainless-steel piping coiled around the outside of the casing; it is anticipated that approximately 7 feet of stainless-steel tubing will be coiled around every one-foot section of casing. The heat transfer fluid will enter the BHE in the piping inside the casing and return to the heat exchanger through the piping coiled around the outside of the casing. Both the influent and effluent piping will be insulated from grade to approximately 10 ft bgs. Thermal grout will be placed in the annular space to about one foot above the last coil. A one-foot bentonite seal will be installed above the thermal grout. The remainder of the annular space to approximately 12 inches bgs will be filled with cement-bentonite grout. BHE will be completed at ground surface with a flush-mount cover to protect the wells from site traffic.

For wells constructed as combination BHE/EW, the casing and the ¾-inch OD flexible stainless-steel piping will be installed to the same target depths and using the same construction methodology as described for BHE-only wells, but the target interval of 10 to 15 ft bgs will include a machine-slotted 0.01-inch (10 slots per inch) stainless steel well screen and a carbon steel casing will be attached to the top of the screen and will terminate inside the flush-mount cover.

At least 24 hours following installation, the combination BHE/EW will be developed by surging/purging using a positive displacement pump and dedicated polyethylene tubing or new, disposable polyethylene bailers. The combination BHE/EW will be developed by alternately surging and purging the well screen until the water removed from the well is reasonably free of visible sediment (50 nephelometric turbidity units), until turbidity units have stabilized (i.e., three consecutive measurements within 10% of each other) following the removal of approximately 10 well volumes of groundwater, or until the well is pumped dry.

If high levels of dissolved phase impacts (greater than 10,000 ppm) or LNAPL are observed during the installation of the BHE/EW or system operation, a short term (two to five days, 8 hours per day), mobile vacuum extraction event will occur to reduce the COC mass in the vicinity of the well.

Soil cuttings and groundwater generated during the installation and development of the newly installed BHE will be managed to minimize contact with the ground surface and eliminate the potential for contaminated groundwater to migrate from the borehole area. Containment may include the use of a soil box or plastic sheeting and will be determined based on field conditions present at each boring location.

3.6.2 Thermocouple Monitoring Point Installation

Six Thermocouple Monitoring Points (TMP) will be installed to a depth of approximately 15 ft bgs to monitor subsurface temperatures and evaluate the BHE's temperature radius of influence (ROI). TMP construction details are shown on **Figure 9**.

At a minimum, the upper five feet of the soil borings will be cleared using air knife/vacuum technologies (or other appropriate methods) to confirm that no utilities and/or obstructions are present at the proposed TMP locations. The soil borings will then be advanced using 4-inch inner diameter HSA techniques. Soil recovered from each soil boring will be field screened for the presence of organic vapors using a PID and will be visually characterized for color, texture, and moisture content. The presence of visible staining, sheen, LNAPL, and obvious odors encountered in the soil (if any) will also be documented.

The TMP will be constructed using 2-inch Schedule 40 polyvinyl chloride (PVC) well casing equipped with a 0.01-inch machine-slotted well screen from approximately 10 to 15 ft bgs. A thermocouple assembly will be placed approximately 12 to 13 ft bgs (at the center of the heating interval) to monitor temperatures in the TTZ. A sand pack will be placed in the annular space around the TMP from approximately 8 ft bgs to the bottom of the well. An approximately 2-foot-thick hydrated bentonite seal will be installed above the sand pack. The remainder of the annular space to approximately 12 inches bgs will be filled with cement-bentonite grout. TMP will be completed at ground surface with a flush-mount cover to protect the wells from site traffic.

Soil cuttings generated during the installation of the TMP will be managed to minimize contact with the ground surface. Containment may include the use of a soil box or plastic sheeting and will be determined based on field conditions present at each boring location.

3.6.3 BHE Conveyance Lines and Thermocouple Conduits Installation

Shallow trenches will be dug to install the BHE conveyance piping. The TMP electrical conduits will also be installed within these trenches. To the extent practicable, the trenches and conveyance piping will be placed to limit disturbance to existing site features and infrastructure. The anticipated location of the

conveyance line trench is shown on **Figure 7**. The locations of the trenches are subject to change in the field based on actual conditions observed.

Prior to excavating the trenches, existing concrete sidewalks and asphalt surfaces will be sawcut and removed, as necessary. The conveyance line trenches will then be excavated using conventional excavation equipment (e.g., mini excavator or equivalent) and/or soft dig methods to a depth of approximately 1.5 ft bgs. The trench width will vary based on the number of individual conveyance lines in specific sections. Excavated materials from the conveyance piping trenches will be field screened for the presence of organic vapors using a PID and visually characterized for the presence of staining, sheen, LNAPL, and obvious odors encountered in the soil (if any). Trench spoils deemed non-impacted or lightly impacted by field screening will be direct-loaded (into a roll-off), characterized, and transported to the appropriate off-site facility for disposal/treatment. Trench spoils deemed potentially heavily impacted by field screening will be isolated in a second roll-off container or drums for subsequent characterization and waste profiling. Following profiling, impacted soils will be transported to an appropriate off-site facility for disposal/treatment.

Prior to installation of the BHE conveyance lines and thermocouple conduits, the bottom and sidewalls of the excavated trenches will be lined with a non-woven geotextile demarcation layer to separate known clean soils from impacted or potentially impacted soils. The demarcation layer will be installed at least one foot below grade for areas that are not covered with an impervious surface (i.e., asphalt or concrete).

The BHE conveyance lines will be constructed using pre-insulated ¾-inch OD flexible stainless-steel piping and placed directly in the trenches. A minimum of six inches will be maintained between BHE conveyance lines and other piping or conduits placed in the trench (e.g., thermocouple conduits). Additionally, BHE conveyance lines will be placed with sufficient distance away from existing subsurface utilities, so the utilities will not be impacted by potential temperature increases. If a sufficient distance cannot be maintained between the existing utility and the BHE conveyance piping, thermal insulating barriers will be used. Based on the anticipated distance between the equipment enclosure and the BHE, it is anticipated that continuous flexible stainless-steel piping lengths will be used for each BHE location. However, if connections between sections of tubing are needed, a vault will be installed to allow the fittings to be accessed for inspection and maintenance. Typical manifold details for BHE conveyance lines are illustrated on **Figure 10**.

The TMP conduits will be constructed using 2-inch diameter Schedule 40 PVC piping and fitted with long sweep elbows for installation of thermocouple wires. If wire connections are required within the trench or the conduit cannot be installed as a continuous run (e.g., due to excessive number of bends), a vault or pull box will be installed to provide access to terminations or facilitate pulling of thermocouple wires.

To facilitate potential future remedial optimization activities, an extra two-inch diameter, Schedule 40 PVC pipe will be installed in the trench from the system to each BHE and BHE/EW location.

Prior to installing the BHE conveyance lines and thermocouple wire conduits, a 1-inch-thick layer of sand will be placed along the bottom of the trench. The BHE conveyance lines and thermocouple wire conduits will be installed. The conveyance lines will be pressure tested to verify integrity of the tubing and connections. Upon acceptance of the pressure testing result, the trench will be backfilled. Sand will be placed around the piping network and to an elevation of 4 inches above the top of the piping network. Non-woven geotextile fabric will then be placed over the sand and approximately 5 to 6 inches of gravel

or soil base will be placed in the trench in six-inch loose-lifts and compacted. Metal tracing tape will be placed in the trench no less than six inches below final grade. The remainder of the trench will be completed consistent with the nature of the surface (i.e., asphalt, concrete, or vegetative) as detailed in **Figure 11**.

Imported materials will meet the applicable requirements specified in 6 NYCRR Part 375-6.7(d) and will require NYSDEC approval prior to being used as backfill. Excavation trenches will be backfilled as soon as possible to facilitate area stability, reduce the potential for groundwater ponding/accumulation, and increase overall site safety. Concrete walkways removed during trenching activities will be restored in-kind with four inches of new commercial fiber reinforced concrete. Asphalt will be restored by placing a minimum of three inches of compacted asphalt binder and two inches of asphalt wear course. All concrete and asphalt materials will be required to meet BMS specifications. Trench cross section details including depth of installations of BHE conveyance piping, TMP conduit, and various surface completion details are shown on **Figure 11**.

The source of off-site general fill will be from a NYSDEC-permitted mine, pit, or quarry. Imported fill materials will be free of foreign chemical contaminants and meet the lower of the 6 NYCRR Part 375 residential use or groundwater protection SCO set forth in 6 NYCRR Part 375 and included in Appendix 5 of DER-10. Imported fill will also be sampled for emerging contaminants in accordance with DEC guidance “Guidelines for Sampling and Analysis of PFAS”. Fill samples will be collected and submitted for analysis to a testing laboratory that complies with ASTM E329 (Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection) at the following frequency:

- For material imported from a virgin mine/pit, one composite sample will be collected.
- For material imported from sources other than a virgin mine/pit, samples will be collected at the frequency presented in DER-10 Table 5.4(e)10.

3.6.4 System Equipment Installation

The TISR^{SM} equipment will be positioned as close as possible to the target remediation area to minimize the amount of trenching, conveyance piping, and potential for heat loss from the system to the BHE locations. The proposed equipment location is shown on **Figure 7**, which will be confirmed with facility personnel during preliminary planning activities. The layout of equipment will be configured to allow adequate room for the safe operation of the system components in accordance with the International Building Codes (IBC) and OSHA. The equipment will also be situated to allow for easy access and safe operation, maintenance, and monitoring (OMM) activities.

3.6.4.1 Equipment Enclosure

The TISR^{SM} equipment will be housed in a prefabricated, turn-key, 8-foot by 12-foot enclosure. The enclosure will be placed on six inches of compacted modified gravel placed over non-woven geotextile fabric. As shown on **Figure 12**, the enclosure will be used to house the TISR^{SM} equipment including a steam-to-water heat exchanger, recirculation pump, manifolds, control panel, electrical panels for power distribution, and thermostatically controlled heater and ventilation fan. The steam-to-water heat exchanger will be separated from the control panel and manifold area by a 2-hour burn rated wall with

roll-up access door. This will isolate the high temperature steam equipment from the system operator during routine OMM.

3.6.4.2 Steam-to-Water Heat Exchanger

As shown in **Figure 13**, a heat exchanger will be utilized to transfer the heat from the facility steam piping network to the TISR^{SM} heat transfer fluid. Connections to the steam and condensate facility piping will be performed at pre-existing pipe terminations on the overhead pipe rack and in accordance with BMS standards. All steam piping and fittings will be insulated and jacketed and will be specified based on the maximum allowable working pressure of the boiler (i.e., 100 pounds per square inch [psi]). Temperature and pressure regulating valves will be used to maintain the appropriate flow of steam through the heat exchanger. Additional temperature and pressure gauges and instruments will be used to monitor system parameters and performance.

3.6.4.3 Heating System

A closed-loop piping system will be used to circulate the TISR^{SM} heat transfer fluid from the steam heat exchanger to the supply manifold (**Figure 13**). The supply manifold will be connected to the sub-surface BHE conveyance piping and deliver heated transfer fluid to each BHE. Cooled transfer fluid will return from the BHE through the conveyance piping to the system enclosure. The cooled heat transfer fluid will then enter the inlet side of the transfer pump and be pumped through the steam-to-water heat exchanger for reheating. An expansion tank and a pressure relief valve with secondary containment will be used to accommodate fluctuations in system pressures. Instrumentation will be included on the supply and return piping to allow pressures, temperature, and flows to be monitored locally and remotely. Each manifold will also contain manual flow control valves. Manifold construction details are shown on **Figure 10**.

3.6.4.4 System Controls

The system will be fully automated and designed to operate continuously with minimal operator oversight, reducing the need for on-site personnel to conduct routine inspections and periodic maintenance. The remedial system will be equipped with fail-safe devices to deactivate the operation in the event of an alarm condition. The system control panel will act as a fail-safe device to monitor and control system inputs and outputs. The system controls will be connected to an email server, which will notify designated personnel when there is a system alarm. The control panel will be a Programmable Logic Controller (PLC) with a human-machine interface (HMI) (to control system operations) and a cellular modem will be used for remote telemetry. The control panel will be capable of monitoring and recording data and controlling system functions.

System operational data will be displayed on the HMI. The system's HMI will be capable of being monitored remotely using a web browser, smart phone application, or equivalent. The HMI will be capable of sending email and text (short message service) notifications to alert personnel of system alarms and status alerts. In addition, a data log containing all recorded data will be emailed daily and accessible by monitoring staff. System monitoring instrumentation will consist of temperature transmitters, pressure transmitters, and flow meters with instantaneous output. All instrumentation will be rated for the maximum possible temperature and pressure of the system.

The following parameters will be monitored (inputs):

- Motor run time
- System supply manifold, return lines, and TMP temperatures
- System supply and return manifold, and individual conveyance line flowrates
- System influent and effluent manifold pressures

The system parameters that will be controlled include (outputs):

- Heat transfer fluid pump operation
- Steam valve operation

A typical electrical one line is shown on **Figure 14**.

3.7 System Startup

Following completion of the TISR[SM] system installation, the system will be charged with the heat transfer fluid consisting of a combination of propylene glycol and distilled water. Start-up tests will be conducted to verify proper installation of system components and system operation settings will be adjusted to correspond as close to the design parameters as possible (e.g., optimal heat transfer fluid flow rate based on the heat exchanger manufacturer specifications).

Start-up tests will initially consist of pressure testing the above grade system piping and inspected for leaks.[1] The circulating pump will then be activated to allow for the transfer fluid to be circulated through the heat exchanger and through the BHE network. Once the BHE components are confirmed to be operating properly, steam will be supplied to the heat exchanger. Field parameters, such as temperature, pressure, and fluid flow rates, will be collected and recorded to verify that the system is operating within the design parameters and to optimize system performance. Based on the field measurements, system adjustments will be performed until the system is operating as close to the design parameters as possible.

Following the initial system start-up, the system will be inspected at a frequency of once per day for the first three days, then weekly for two weeks, and then once a month during OMM activities (as presented in Section 5).

3.8 Waste Management

Waste generated during the installation of the TISR[SM] system will be managed in accordance with Section 12.3 (Management of Investigation-Derived Waste) of the FSAP (OBG 2013). The following waste streams are anticipated to be generated during the installation of the TISR[SM] system:

- Excavated soil from trenches
- Soil cuttings from well installation
- Purge water and decontamination water from well installation
- Groundwater recovered during short term vacuum extraction events, if required

[1] Subsurface conveyance piping will be hydrostatically pressure tested prior to and after backfilling of trenches.

Waste generated during the TISR^{SM} system construction work will be appropriately containerized, labeled, and transported to a central staging area located on-site within secondary containment pending waste profiling results. Soil cuttings, personal protective equipment, spent disposable materials will be segregated by waste type and placed in USDOT-approved 55-gallon drums. Excavation spoils will be direct loaded into roll-offs. Water generated during well development and decontamination activities will be stored in USDOT-approved 55-gallon drums or 275-gallon plastic totes.

Each drum/container will be appropriately labeled (e.g., with the contents, soil boring/excavation location, generator, location, and date). Waste profile samples will be collected and sent to Eurofins Lancaster Laboratories in Lancaster, Pennsylvania, for analysis in accordance with the FSAP (OBG 2013). Upon receipt of the sampling results, waste will be profiled and shipped under a manifest or bill of lading for off-site disposal at an appropriate hazardous or non-hazardous disposal facility, as dictated by the sample results and profile. Wastewater may be discharged to the BMS wastewater pretreatment plant if it is determined to be non-hazardous.

Roll-offs will be covered at all times they are not being filled while on site and prior to leaving the work zone. A log of the loads leaving the site will be maintained, which will include information such as waste type, waste origin (e.g., boring number(s), trench segment(s)), transporter, destination, trailer/dump license plate number, and any other pertinent information (e.g., manifest number). Generated wastes will be transported by a waste transporter with a valid Part 364 permit.

4 PROJECT IMPLEMENTATION SUPPORT

This section presents project implementation support activities to be completed to facilitate the construction of the TISR[SM] system (described in Section 3).

4.1 Pre-Construction Planning

Pre-construction planning will include designating responsible personnel, ensuring availability of necessary equipment and materials, establishing project schedules, and reviewing administrative and procedural requirements for the remedial construction activities. Additionally, a pre-construction meeting between BMS, Arcadis, NYSDEC, NYSDOH, and applicable subcontractors will be conducted prior to the start of work.

4.2 Mobilization

Mobilization will be initiated following NYSDEC approval of this IRM Work Plan. In general, mobilization activities will include establishing personnel, equipment, and materials at the project area necessary to support the system construction activities. Mobilization activities include, but are not limited to, the following:

- Mobilizing necessary labor, equipment, materials, tools, and supervision to commence project work.
- Coordinating with a private utility locator prior to construction activities to mark all on-site underground utilities.
- Providing and maintaining first-aid facilities and portable sanitary services for use by on-site personnel engaged in the remedial activities.
- Obtaining electrical service for electrical equipment and all necessary utilities for use during the remedial construction.

4.3 Site Preparation

Site preparation activities will generally consist of the following:

- Verifying site conditions and identifying, marking, and verifying the location(s) of all aboveground and underground utilities, equipment, and structures, as necessary, to implement the remedial activities.
- Maintaining appropriate clearances from utilities (e.g., active overhead electric lines, underground conduit/piping).
- Installing erosion and sediment controls (e.g., silt fence or filter sock) downgradient from the anticipated trenching areas and access areas anticipated to be disturbed during the construction activities. Anticipated erosion and sediment controls to be used during the construction of the TISR[SM] system are discussed in Section 4.8.
- Erecting perimeter fencing and post project signage.
- Establishing survey control for trenching areas and work limits.

- Installing work zone air monitoring equipment (to be relocated, as appropriate, based on wind direction) as required by the NYSDEC-approved CAMP (Appendix E) and the HASP (Appendix F).
- Constructing an equipment decontamination area (**Figure 15)**.

4.4 Project Meetings and Inspections

Anticipated on-site project meetings to be attended by field personnel participating in the construction activities will consist of:

- Daily Site Safety (Tailgate Safety) Meetings
- Bi-weekly Construction Progress Meetings/Calls (NYSDEC and NYSDOH to be invited)
- Pre-Startup Safety Review in accordance with BMS procedures
- Pre-Final Inspection (Punch List)
- Final Inspection

Inspection activities will be performed under the oversight of a NYS PE or a person under their supervision or responsible charge.

4.5 Survey Control

Survey control will be maintained during construction work. Additionally, following the completion of the TISR^{SM} system construction, a land survey will be conducted in the project area to document the location of the TISR^{SM} system components and to facilitate the preparation of system construction as-built drawings. The survey control/land survey will be completed by a New York State Licensed Surveyor to identify the horizontal and vertical extent of soil removal, the location of the TISR^{SM} system components, and casing location/elevation for the BHE/TMP and conveyance piping runs. Additional topographic survey information will also be obtained, including existing site features such as roadways/sidewalks, monitoring wells, paved/vegetated surfaces, etc. The horizontal survey will be conducted relative to the New York State Plan Coordinate System, and vertical survey measurements will be relative to the North American Vertical Datum of 1988.

The survey information (including final as-built information) will be used to document that the TISR^{SM} System construction activities have been completed consistent with the project design requirements. The survey information (including an as-built survey, sealed, and signed by the Contractor's NYS licensed surveyor) will be included in the Construction Completion Report (CCR).

4.6 Site Security, Control, and Access

Access to the project area during construction work will be restricted. Security around the work limits shall be maintained during both work and non-work hours. The level of security will be dependent on the activities being performed and location of activities. Security measures to be implemented may include: (1) temporary fencing and/or barriers; (2) warning tape and signs; (3) maintenance of sign-in/sign-out sheets; and/or (4) implementation of safe work practices.

4.7 Dust, Vapor and Odor Monitoring and Mitigation

As required by the CAMP approved by the NYSDEC as Appendices A and D of the *Remedial Investigation Work Plan* (OBG 2013), real-time airborne particulate monitoring will be conducted continuously during intrusive and/or potential dust generating activities (e.g., excavation, backfilling, material handling activities) using instrumentation equipped with electronic data-logging capabilities. Additionally, as required by the CAMP, VOCs will be monitored continuously during intrusive and/or potential dust-generating activities.

Community air monitoring (and associated reporting) for vapor and dust will be conducted in accordance with the CAMP. Corrective actions (in the event of an exceedance) will be implemented in accordance with the CAMP.

In the event of an exceedance of an air monitoring action level for either vapors or dust, BMS will be notified as soon as the exceedance is identified. BMS will then notify NYSDEC and NYSDOH, within one business day of being informed of an exceedance. The notification will include the monitoring data, the cause of the exceedance, and corrective measures implemented (or to be implemented) in response to the exceedance. Work will not continue until exceedances are addressed in consultation with BMS. Real time exceedances will be addressed immediately.

Dust, vapors, and odors generated during intrusive activities will be addressed in accordance with the CAMP. The following dust, vapor, and/or odor control measures may be used during these activities, depending upon specific circumstances, visual observations, and air monitoring results:

- Water spray
- BioSolve® PinkWater®
- Polyethylene sheeting (e.g., for covering excavation faces, material stockpiles)
- Minimizing excavation surface area to be exposed at any given time.
- Vapor suppression foam

Upon completion of a shift and prior to leaving the site at the end of a day, any open excavations will be backfilled to minimize potential dust, vapors, or odors, to the extent practicable, or covered with polyethylene sheeting. During the workday, exposed areas may be covered with polyethylene sheeting, foamed, or temporarily covered with appropriate soil, as needed. An odor agent (e.g., Bio-Solve®, Rusmar Foam product) will be used, as necessary.

Imported soil stockpiles will be covered with polyethylene sheeting and surrounded by appropriate erosion controls (see Section 4.8). As indicated in Section 4.8, excavated materials will be direct-loaded into containers for off-site transportation/disposal. In the event that excavated materials are stockpiled on-site, stockpiles will be lined, bermed, and covered and surrounded by appropriate erosion controls (see Section 4.8).

A more detailed description of the air monitoring program, including routine requirements, action levels for increased monitoring, provisions for corrective actions to address air emissions, and/or provisions for remedial action modifications/work stoppage, is provided in the CAMP.

4.8 Erosion and Sediment Controls

Erosion and sediment control measures will be installed and maintained in accordance with the latest edition of the *New York Standards and Specifications for Erosion and Sediment Control* (NYSDEC 2016b) (or most recent). Erosion and sediment control measures anticipated to be used during the installation of the TISR^{SM} system will generally consist of silt fencing or filter sock or equivalent. Typical silt fencing or filter sock installation details are shown on **Figure 15**. Erosion and sediment controls will be installed downgradient from the anticipated trenching areas and access areas anticipated to be disturbed during the construction activities. The specific configuration and locations of the erosion and sediment controls will be determined in the field during the installation of the TISR^{SM} system.

If excavated soils will be transferred directly to a roll-off in a location not immediately adjacent to the excavation, measures will be included to limit and immediately address tracking by the construction equipment moving the material. Stormwater accumulated in the excavated soil stockpile pad, once stockpiling begins, will be contained, characterized, and disposed of properly.

5 SYSTEM OPERATION, MAINTENANCE, AND MONITORING

This section presents an overview of the OMM activities associated with the TISR^{SM} system that will be installed to address the environmental impacts identified at the Building 55 Area. OMM activities will generally include:

- Performance monitoring activities to evaluate the effectiveness of TISR^{SM} in reducing COC concentrations.
- OMM activities to ensure reliable operation and performance in accordance with design-based parameters.

5.1 Performance Monitoring

Routine performance monitoring activities will be conducted to evaluate the effectiveness of TISR^{SM} in reducing COC concentrations. Performance monitoring activities will generally consist of completing a baseline groundwater monitoring event before the TISR^{SM} system is started, collecting monthly system temperature readings, and conducting quarterly groundwater monitoring events. Performance monitoring activities will be conducted in accordance with the monitoring program presented in the table below.

Table 5.1 TISR^{SM} System Performance Monitoring Program

Location	Matrix	Analytical Parameters	Frequency
Baseline Monitoring			
BHE/EW-1 – BHE/EW-8, BDA-12WT, BDA-13WT, BDA-14WT	Water	VOC (USEPA SW-846 Method 8260C)	Once
		SVOC (USEPA SW-846 Method 8270C)	
		Glycols (USEPA SW-846 Method 8015D)	
		Aldehydes (USEPA SW-846 Method 8315A)	
		Natural Attenuation Parameters	
		System Temperature Readings	
Performance Monitoring			
BHE/EW-1 – BHE/EW-8, BDA-12WT, BDA-13WT, BDA-14WT	Water	VOC (USEPA SW-846 Method 8260C)	Quarterly for the first year of operations, then at reduced frequency, as appropriate.
		SVOC (USEPA SW-846 Method 870C)	
		Glycols (USEPA SW-846 Method 8015D)	
		Aldehydes (USEPA SW-846 Method 8315A)	
		Natural Attenuation Parameters	
		System Temperature Readings	Monthly

Monthly temperature readings will be collected from the TISR^{SM} system manifolds to evaluate influent and effluent temperatures in each of the BHE. Additionally, the TISR^{SM} system will automatically collect temperature readings at each TMP thermocouple assembly, using data loggers, to evaluate temperature trends in the TTZ. The collected data will be downloaded during the monthly OMM activities. Depth-to-water, depth-to-LNAPL (if any), total well depth, and well head VOC concentrations will also be measured

monthly at each BHE/EW using an oil-water interface probe and PID. Also, well head VOC concentrations will be monitored from monitoring wells BDA-14WTand BDA-14T.

Groundwater monitoring events will be conducted on a quarterly basis during the first year of operations to evaluate the following:

- Groundwater concentration trends and treatment progress toward meeting RAO for VOC, SVOC, glycols, and aldehydes.
- Biogeochemical conditions in the TTZ for indicators that aerobic or anaerobic biodegradation processes are occurring.

Groundwater samples will be collected using low-flow sampling techniques (a portable peristaltic pump with a dedicated sample tube [one per well]) and will be submitted to Eurofins Lancaster Environmental Laboratory for laboratory analysis in accordance with the monitoring program in Table 5.1 and consistent with the NYSDEC-approved QAPP for the site (Appendix G). Specific to biodegradation, groundwater samples will generally be analyzed for electron acceptors and donors, dissolved gasses produced as byproducts of degradation reactions and other natural attenuation indicator parameters. The list and rationale for collecting the proposed natural attenuation parameters is shown in Table 5.2.

Table 5.2 Natural Attenuation Parameters

Parameter	Field or Laboratory	Rationale / Data Interpretation
Dissolved Oxygen	Field	Primary terminal electron acceptor. The O_2 concentrations are an indicator of the presence of aerobic or anaerobic degradation conditions.
pH	Field	Aerobic and anaerobic microbial and abiotic reactions may be pH sensitive.
Temperature	Field	Aerobic and anaerobic microbial reactions may be temperature sensitive.
Conductivity	Field	General water quality parameter. Indicator of total ion content.
Turbidity	Field	General water quality parameter. Indicator of solids content.
Oxidation reduction potential	Field	The magnitude of this parameter is an indicator of oxidative state.
Nitrate	Laboratory	Alternate electron acceptor in absence of oxygen.
Ferrous Iron	Laboratory	Metabolic byproduct of Ferric iron reduction during microbial degradation of organic compounds in the absence of dissolved oxygen and nitrate.
Sulfate	Laboratory	Alternate electron acceptor in absence of oxygen, nitrate, and ferric iron.
Methane	Laboratory	Metabolic byproduct of carbon dioxide reduction during microbial degradation of organic compounds in the absence of dissolved oxygen, $nitrate^-$, manganese IV, and Ferrous iron.
Nitrogen:Phosphorus:Potassium	Laboratory	Nutrients needed to support microbial growth (only collected during the baseline and once a year).

Laboratory data deliverables will comply with DER-10, Appendix 2B. The data will be added to the project database.

5.2 System Operation and Maintenance

An OMM plan will be developed for the TISR^{SM} system and submitted for agency approval. The OMM plan will provide details regarding the system operation and maintenance requirements, including manufacturer recommended mechanical and electrical maintenance requirements, equipment make and model, troubleshooting, and manufacturer contact information for TISR^{SM} system components.

OMM activities will consist of monthly system inspections conducted in conjunction with the monthly performance monitoring activities. During these inspections, the breathing air space around the treatment area will be monitored for carbon dioxide, oxygen, and VOC concentrations using hand-held gas meters to ensure the safety of field technicians and site workers. If subsurface utilities are identified in the treatment areas, an inspection program will also be developed to ensure VOC vapors are not migrating along or within these utilities.

TISR^{SM} inspections will include checking the functionality of each system component, inspecting visible connections for leaks, and bleeding the system lines from potentially accumulated air (as necessary) (note that accumulated air does not contact contaminants and is non-hazardous). Fluid flow, pressures, and temperatures will also be recorded during TISR^{SM} system inspection and used to review and evaluate system operation. System operational settings (e.g., heat transfer fluid flow rates, pump operation, and datalogger and telemetry settings) will be evaluated and then adjusted, as necessary, to optimize system performance based on the site conditions. The monitoring and inspection frequencies may also be modified based on remote data collection or field observations.

6 REPORTING

Following the completion of the IRM activities described herein, a CCR will be prepared to summarize the TISR[SM] installation and OMM activities and results. The CCR will include the following information:

- A summary of the TISR[SM] installation activities, including:
  - Record drawings.
  - Boring and well construction logs, including BHE and TMP.
  - Imported material documentation, including bills-of-lading/weight tickets showing materials originated from an approved source.
  - Information and documentation regarding the final quantities of materials disposed of/treated off-site, including executed manifests and bill of lading.
  - Inspection reports and photographs documenting installation activities.
  - Community air monitoring data results.
  - Deviations from the approved IRM Work Plan.
- OMM Results, including:
  - TISR[SM] performance operational data (e.g., temperature and pressure data).
  - Analytical results for groundwater monitoring data through first quarter of monitoring.
- Photographs documenting the remediation activities conducted during the remediation construction phase.
- Correspondence with the NYSDEC and others relevant to TISR[SM] installation and OMM activities.
- Other relevant information.

The CCR will be certified by a NYS professional consistent with DER-10, Section 1.5.

7 SCHEDULE

The tentative schedule for completing the activities identified in this IRM Work Plan is presented below.

Table 7.0 Schedule

Activity	Anticipated Schedule (weeks following approval)
Equipment and materials procurement	12
Complete OMM Plan	14
Complete constructing of TISR^{SM} system	18
Complete start-up system	20
Start routine system operation	22
Submit CCR to NYSDEC	56

8 REFERENCES

Arcadis. 2018. Groundwater Remedy Pre-Design Investigation and Supplemental Sampling Work Plan. Site #C734138 BMS Syracuse North Campus Restoration Area Thompson Road, East Syracuse, New York. August.

Arcadis. 2019. Remedial Investigation Report. Bristol-Myers Squibb, East Syracuse, New York. July.

Arcadis. 2020. Building 55 Area Pre-Design Investigation Work Plan. Bristol-Myers Squibb, East Syracuse, New York. July 2020. As modified by the NYSDEC approval letter dated September 10, 2020.

Daniel, D.E., R.C. Loehr, M.T. Webster, and R.S. Kasevich. 2000. In Soil Vapor Extraction Using Radio Frequency Heating: Resource Manual and Technology Demonstration, ed. D.F. Lowe, C.L. Oubre, and C.H. Ward. Boca Raton, Florida: Lewis.

Fischer, A., M. Muller, and J. Klasmeier. 2004. Determination of Henry's law constant for methyl tert-butyl ether (MTBE) at groundwater temperatures. Chemosphere 54: 689–694.

Horst, J., C. Flanders, M. Klemmer, D.S. Randhawa, D. Rosso. 2018. Low-Temperature Thermal Remediation: Gaining Traction as a Green Remedial Alternative. Groundwater Monitoring & Remediation doi: 10.1111/gwmr.12295.

Jeffers, P.M. and N.L. Wolfe. 1996. Homogeneous hydrolysis rate constants—Part II: Additions, corrections, and halogen effects. 15: 1066–1070.

Jeffers, P.M., L.M. Ward, L.M. Woytowitch, and N.L. Wolfe. 1989. Homogeneous hydrolysis rate constants for selected chlorinated methanes, ethanes, ethenes, and propanes. Environmental Science & Technology 23, no. 8: 965–969.

Knauss, K.G., M.J. Dibley, R.N. Leif, D.A. Mew, and R.D. Aines. 2000. The aqueous solubility of trichloroethene (TCE) and tetrachloroethene (PCE) as a function of temperature. Applied Geochemistry 15, no. 4: 501–512.

Margesin, R. and F. Schinner. 2001. Biodegradation and bioremediation of hydrocarbons in extreme environments. Applied Microbial Biotechnology 56: 650–663.

NYSDEC. 1998-2009. Technical and Operational Guidance Series (TOGS) 1.1.1. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June. Available online at: http://www.dec.ny.gov/docs/water_pdf/togs111.pdf.

NYSDEC. 2010a. DER-10 Technical Guidance for Site Investigation and Remediation. May 3. Available online at: http://www.dec.ny.gov/regulations/67386.html.

NYSDEC. 2010b. CP-51 / Soil Cleanup Guidance. October 21. Available online at: http://www.dec.ny.gov/docs/remediation_hudson_pdf/cpsoil.pdf.

NYSDEC. 2016a. DAR-1: Guidelines for the Evaluation and Control of Ambient Air Contaminants Under Part 212. August 10, 2016. Available online at: https://www.dec.ny.gov/docs/air-pdf/dar1.pdf.

NYSDEC. 2016b. New York Standards and Specifications for Erosion and Sediment Control. November 2016. Available online at: https://www.dec.ny.gov/chemical/29066.html.

O'Brien & Gere Engineers (OBG). 2013a. Work Plan: Remedial Investigation BMS Syracuse North Campus Restoration Area, Site No. C734138. March 2013. As modified by letter from the NYSDEC dated April 3, 2013 and a letter from BMS dated April 18, 2013.

OBG. 2013b. Field Sampling and Analysis Plan: BMS Syracuse North Campus Restoration Area, Site No. C734138. March 2013.

OBG. 2013c. Quality Assurance Project Plan: BMS Syracuse North Campus Restoration Area, Site No. C734138. March 2013.

OBG. 2013d. Community Air Monitoring Plan: BMS Syracuse North Campus Restoration Area, Site No. C734138. March 2013.

Peters, U., F. Nierlich, M. Sakuth, and M. Laugier. 2002. Methyl tert-butyl ether, physical and chemical properties. In Ullmanns Encyclopedia of Industrial Chemistry, 6th ed. Weinheim, Germany: Wiley-VCH Verlag GmbH & Co. KGaA. Available online at: https://doi.org/10.1002/14356007.a16_543.

Shukla, H.M. and R.E. Hicks. 1984. Process Design Manual for Stripping of Organics, EPA/600/S2-84/139. Washington, DC: U.S. Environmental Protection Agency. September 1984.

Stephen, H. and T. Stephen. 1963. Solubilities of Inorganic and Organic Compounds. Vol. 1. New York: Macmillan.

Washington, J.W. 1995. Hydrolysis rates and dissolved volatile organic compounds: Principals, temperature effects, and literature review. Groundwater 33: 415–424.

Xu, J.G. 1997. Biodegradation of petroleum hydrocarbons in soil as affected by heating and forced aeration. Journal of Environmental Quality 26, no. 6: 1511–1516.

Yadav, B., S. Shrestha, and M. Hassanizadeh. 2012. Biodegradation of toluene under seasonal and diurnal fluctuations of soil-water temperature. Water, Air, & Soil Pollution 223: 3579–3588. Available online at: https://doi.org/10.1007/s11270-011-1052-x.

TABLES

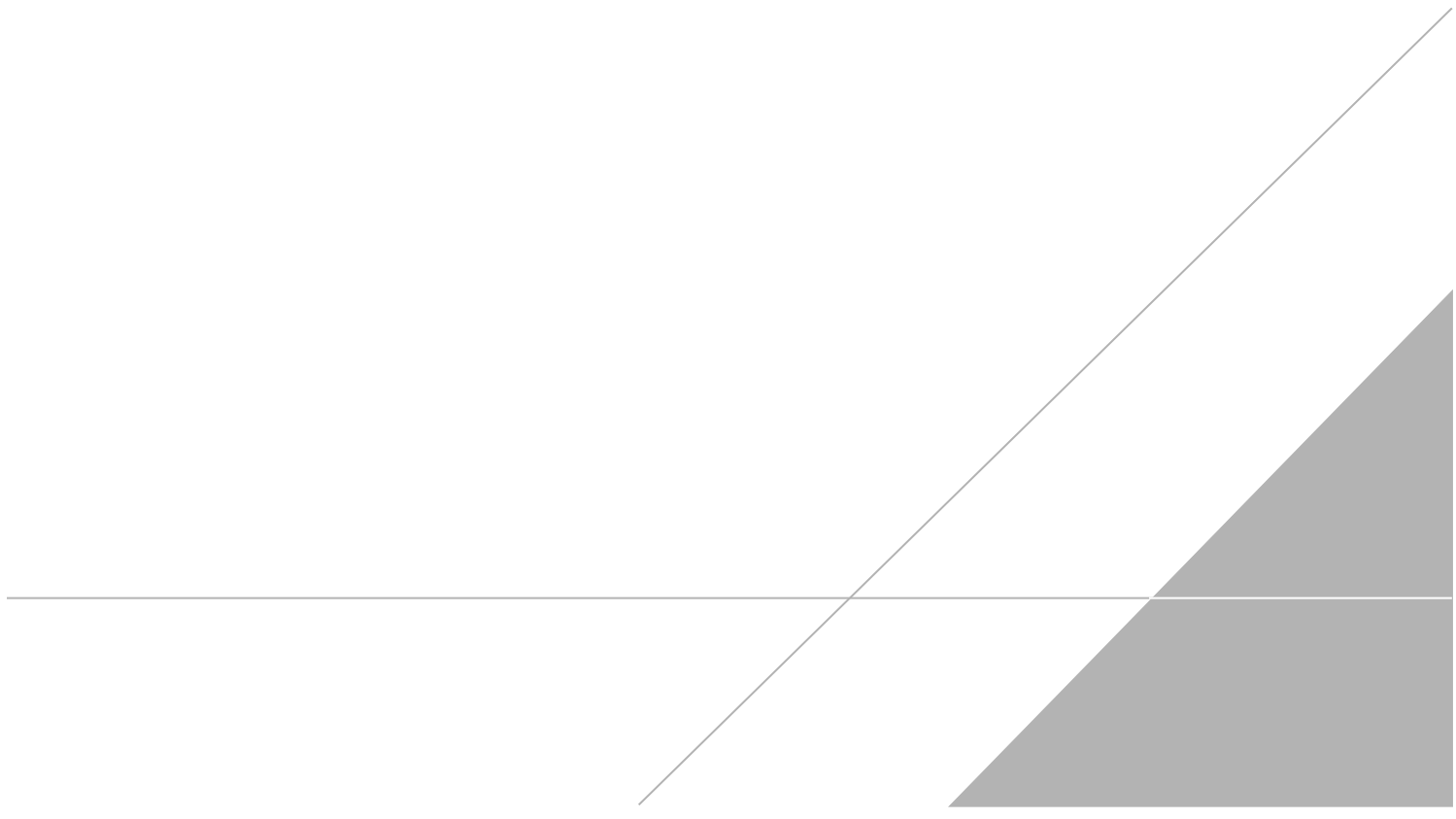


Table 1
Pre-Design Investigation Field Activity Summary

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Boring Location	Date Completed	Boring Termination Depth (bgs)	Depth to Till (bgs)	Impacted Interval (bgs)	Highest PID Reading	Depth of Highest PID Reading (bgs)	Observation of Potential Impacts	Other Observations/Notes	Soil Sample Intervals Selected for Analysis (bgs)	Temporary Piezometer Installed for Collection of Grab GW Sample
B55-PDI-SB-1	11/9/2020	19.0 ft	16.9 ft	7.5-12.0 ft	1,808 ppm	10.5 ft	Black staining, degraded petroleum-like odor, sheen	None	8-10 ft & 16-16.9 ft (top of till)	yes (insufficient water to sample)
B55-PDI-SB-2	11/10/2020	20.0 ft	18.6 ft	11-12.5 ft	487 ppm	11.1 ft	Black staining, degraded petroleum-like odor	None	10-12 ft	no
B55-PDI-SB-3	11/10/2020	20.0 ft	18.0 ft	8.9-9.9 ft	457 ppm	9.6 ft	Black staining, degraded petroleum-like odor	None	None	yes
B55-PDI-SB-4	11/10/2020	20.0 ft	16.6 ft	11.5-12.0 ft	>2,000 ppm	12.0 ft	Black staining, degraded petroleum-like odor	Pale red-purple discoloration from 9.4-9.5 ft bgs	None	yes
B55-PDI-SB-5	11/11/2020	20.0 ft	18.1 ft	8.5-12.5 ft	1.3 ppm	8.7 ft	Very faint odor	None	None	yes
B55-PDI-SB-6	11/11/2020	20.0 ft	16.8 ft	12.7 ft	1.8 ppm	12.7 ft	Very faint odor	None	12-13 ft	no
B55-PDI-SB-7	11/11/2020	20.0 ft	17.9 ft	13-14 ft	7.8 ppm	13.4 ft	Very faint odor	None	13-14 ft	yes
B55-PDI-SB-8	11/11/2020	20.0 ft	16.3 ft	12-13 ft	1.8 ppm	13.0 ft	Very faint odor	None	None	no
B55-PDI-SB-9	11/11/2020	4.0 ft	NA	NA	0.0 ppm	NA	No obvious visual or olfactory impacts	Refusal encountered at 4.0 feet bgs	None	no
B55-PDI-SB-10	11/12/2020	18.5 ft	16.0 ft	8.6-10.6 ft	>2,000 ppm	8.6-10.6 ft	Black staining, degraded petroleum-like odor	Dup111820 collected here	9-10 ft	no
B55-PDI-SB-11	11/12/2020	16.0 ft	13.5 ft	4.2-5.6 ft	404 ppm	5.4 ft	Black staining, degraded petroleum-like odor	None	5-6 ft	no
B55-PDI-SB-12	11/12/2020	16.0 ft	12.4 ft	8-9 ft	1.4 ppm	8.7 ft	Very faint odor	None	None	no
B55-PDI-SB-13	11/13/2020	14.5 ft	12.5 ft	5.7-8.3 ft	>2,000 ppm	6-8 ft	Black staining, degraded petroleum-like odor; faint odors from 8-12.5 ft	None	6-8 ft & 12-12.5 ft (top of till)	no
B55-PDI-SB-14	11/13/2020	16.0 ft	15.3 ft	8-14.6 ft	20 ppm	8.4 ft	Very faint odor	None	None	no
B55-PDI-SB-15	11/13/2020	19.3 ft	17.6 ft	8.6-9.1 ft	199 ppm	8.6 ft	Black staining, faint degraded petroleum-like odor; faint odors from 9.1-12 ft	None	8-9 ft	yes
B55-PDI-SB-16	11/13/2020	15.0 ft	13.1 ft	NA	0.8 ppm	9.4 ft	No obvious visual or olfactory impacts	None	None	yes
B55-PDI-SB-17	11/16/2020	16.0 ft	14.1 ft	8.2-10.9 ft	304 ppm	8.4 ft	Black staining, degraded petroleum-like odor	None	8-9 ft; 9-10 ft (below visual impacts)	no
B55-PDI-SB-18	11/16/2020	22.5 ft	20.1 ft	9.9-10.5 ft	156 ppm	9.9-10.5 ft	Black staining, degraded petroleum-like odor	None	9.5-10.5 ft; 10.7-11.7 ft (below visual impacts)	yes
B55-PDI-SB-19	11/16/2020	20.0 ft	16.6 ft	11.6-12.8 ft	8 ppm	11.6 ft	Very faint odor	None	11.6-12.6 ft; 12.6-13.6 ft (below visual impacts)	no
B55-PDI-SB-20	11/16/2020	14.0 ft	NA	NA	0.0 ppm	NA	No obvious visual or olfactory impacts	Refusal encountered at 14.0 feet bgs; did not encounter till	None	no
B55-PDI-SB-21	11/17/2020	14.0 ft	12.9 ft	4.9-8.4 ft	5 ppm	4.9 ft	Very faint odor	None	4.5-5.5 ft	yes
B55-PDI-SB-22	11/17/2020	15.2 ft	12.9 ft	4-8 ft	24 ppm	5.4 ft	Very faint odor	MS/MSD collected here	5.2-6.2 ft	no

Note:
1. Soil and groundwater samples, along with corresponding quality assurance/quality control samples, were submitted to Eurofins Lancaster Environmental Laboratory for analysis of VOC in accordance with USEPA SW-846 Method 8260C, SVOC in accordance with USEPA SW-846 Method 8270C, and aldehydes in accordance with USEPA SW-846 Method 8315A.

Acronyms and Abbreviations:
bgs = below ground surface.
BMS = Bristol-Myers Squibb Company.
ft = feet.
GW = groundwater.
MS/MSD = matrix spike/matrix spike duplicate samples.
NA = not applicable.
PID = photoionization detector.
ppm = parts per million.
SVOC = semivolatile organic compound.
USEPA = United States Environmental Protection Agency.
VOC = volatile organic compound.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-01		B55-PDI-SB-02	B55-PDI-SB-06	B55-PDI-SB-07	B55-PDI-SB-10
Sample Depth (ft):					8 - 10	16 - 16.9	10 - 12	12 - 13	13 - 14	9 - 10
Date Collected:					11/09/20	11/09/20	11/10/20	11/11/20	11/11/20	11/12/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-SB-01 (8-10) 11102020	B55-PDI-SB-01 (16-16.9) 11102020	B55-PDI-SB-02 (10-12) 11102020	B55-PDI-SB-06 (12-13) 11172020	B55-PDI-PDI-07 (13-14) 11132020	B55-PDI-SB-10 (9-10) 11182020
VOCs - USEPA SW-486 Method 8260C (mg/kg)										
1,1,1-Trichloroethane	71-55-6	0.68	- -	500	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,1,2,2-Tetrachloroethane	79-34-5	- -	0.6	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	- -	6	- -	2.2 U	0.0082 U	0.64 U	0.0084 U	0.0079 U	0.61 U [0.59 U]
1,1,2-Trichloroethane	79-00-5	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,1-Dichloroethane	75-34-3	0.27	- -	240	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,1-Dichloroethene	75-35-4	0.33	- -	500	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,2,3-Trichlorobenzene	87-61-6	- -	- -	- -	2.2 U	0.0082 U	0.64 U	0.0084 U	0.0079 U	0.61 U [0.59 U]
1,2,4-Trichlorobenzene	120-82-1	- -	3.4	- -	2.2 U	0.0082 U	0.64 U	0.0084 U	0.0079 U	0.61 U [0.59 U]
1,2,4-Trimethylbenzene	95-63-6	3.6	- -	190	**240 D**	0.0076	**34 D**	0.00079 J	0.00040 J	**47 D [38 D]**
1,2-Dibromo-3-chloropropane	96-12-8	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,2-Dibromoethane	106-93-4	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,2-Dichlorobenzene	95-50-1	1.1	- -	500	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,2-Dichloroethane	107-06-2	0.02	- -	30	*1.1 U*	0.0041 U	*0.32 U*	0.0042 U	0.0040 U	*0.30 U [0.3 U]*
1,2-Dichloropropane	78-87-5	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,3,5-Trimethylbenzene	108-67-8	8.4	- -	190	**55**	0.0022 J	8.2 J	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,3-Dichlorobenzene	541-73-1	2.4	- -	280	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,4-Dichlorobenzene	106-46-7	1.8	- -	130	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
1,4-Dioxane	123-91-1	0.1	- -	130	*56 U*	*0.20 U*	*16 U*	*0.21 U*	*0.20 U*	*15 U [15 U]*
2-Hexanone	591-78-6	- -	- -	- -	2.2 U	0.0082 U	0.64 U	0.0084 U	0.0079 U	0.61 U [0.59 U]
2-Nitropropane	79-46-9	- -	- -	- -	R	0.0082 U	R	0.0084 U	0.0079 U	R [R]
Acetone	67-64-1	0.05	- -	500	*4.4 U*	0.038	*1.3 U*	0.049	0.027	*1.2 U [1.2 U]*
Acetonitrile	75-05-8	- -	- -	- -	22 U	0.082 U	6.4 U	0.084 U	0.079 U	6.1 U [5.9 U]
Benzene	71-43-2	0.06	- -	44	*1.1 U*	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Bromochloromethane	74-97-5	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Bromodichloromethane	75-27-4	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Bromoform	75-25-2	- -	- -	- -	2.2 U	0.0082 U	0.64 U	0.0084 U	0.0079 U	0.61 U [0.59 U]
Bromomethane	74-83-9	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Carbon Disulfide	75-15-0	- -	2.7	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.00079 J	0.30 U [0.3 U]
Carbon Tetrachloride	56-23-5	0.76	- -	22	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Chlorobenzene	108-90-7	1.1	- -	500	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Chlorodifluoromethane	75-45-6	- -	- -	- -	2.2 U	0.0082 U	0.64 U	0.0084 U	0.0079 U	0.61 U [0.59 U]
Chloroethane	75-00-3	- -	1.9	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Chloroform	67-66-3	0.37	- -	350	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Chloromethane	74-87-3	- -	- -	- -	1.1 UJ	0.0041 U	0.32 UJ	0.0042 U	0.0040 U	0.30 U [0.3 U]
cis-1,2-Dichloroethene	156-59-2	0.25	- -	500	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
cis-1,3-Dichloropropene	10061-01-5	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Cyclohexane	110-82-7	- -	- -	- -	37	0.0056	0.32 U	0.0042 U	0.027	0.30 U [0.3 U]
Cyclohexanone	108-94-1	- -	- -	- -	56 U	0.20 U	16 U	0.026 J	0.033 J	15 U [15 U]

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-01		B55-PDI-SB-02	B55-PDI-SB-06	B55-PDI-SB-07	B55-PDI-SB-10
Sample Depth (ft):					8 - 10	16 - 16.9	10 - 12	12 - 13	13 - 14	9 - 10
Date Collected:					11/09/20	11/09/20	11/10/20	11/11/20	11/11/20	11/12/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-SB-01 (8-10) 11102020	B55-PDI-SB-01 (16-16.9) 11102020	B55-PDI-SB-02 (10-12) 11102020	B55-PDI-SB-06 (12-13) 11172020	B55-PDI-07 (13-14) 11132020	B55-PDI-SB-10 (9-10) 11182020
VOCs - USEPA SW-486 Method 8260C (mg/kg) (cont'd)										
Dibromochloromethane	124-48-1	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Dichlorodifluoromethane	75-71-8	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Ethyl acetate	141-78-6	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Ethyl ether	60-29-7	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Ethylbenzene	100-41-4	1	- -	390	**17**	0.00053 J	0.35 J	0.0042 U	0.017	0.68 J [0.95 J]
Isobutanol	78-83-1	- -	- -	- -	56 U	0.20 U	16 U	0.21 U	0.20 U	15 U [15 U]
Isopropylbenzene	98-82-8	- -	2.3	- -	***10***	0.00033 J	1.4	0.0042 U	0.0063	***2.3 J [2 J]***
m,p-Xylene	ARC-mpXyl	- -	- -	- -	40	0.0015 J	1.3 J	0.0042 U	0.0060	1.0 J [1.2 J]
Methyl acetate	79-20-9	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Methyl ethyl ketone (MEK, 2-butanone)	78-93-3	0.12	0.3	500	*2.2 UJ*	0.0082 U	*0.64 UJ*	0.0084 U	0.0050 J	0.61 U [0.59 U]
Methyl isobutyl ketone (MIBK, 4-methyl-2-pentanone)	108-10-1	- -	1	- -	2.2 U	0.0082 U	0.64 U	0.0084 U	0.0079 U	0.61 U [0.59 U]
Methyl tert-butyl ether	1634-04-4	0.93	- -	500	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Methylcyclohexane	108-87-2	- -	- -	- -	83 D	0.0029 J	2.3 J	0.0042 U	0.0060	58 D [48 D]
Methylene Chloride	75-09-2	0.05	- -	500	*1.1 U*	0.0041 U	*0.32 U*	0.0042 U	0.0040 U	*0.30 U [0.3 U]*
Naphthalene	91-20-3	12	- -	500	**13**	0.0041 U	0.57 J	0.0042 U	0.0061	0.26 J [0.31 J]
n-Butanol	71-36-3	- -	- -	- -	56 U	0.20 U	16 U	0.21 U	0.20 U	15 U [15 U]
n-Butylbenzene	104-51-8	12	- -	500	11	0.0065 U	2.5 J	0.0067 U	0.0027 J	10 J [10 J]
N-Heptane	142-82-5	- -	- -	- -	110 D	0.0065 U	0.78 J	0.0067 U	0.0064 U	6.1 J [4 J]
o-Xylene	95-47-6	- -	- -	- -	9.3	0.00036 J	0.22 J	0.0042 U	0.0033 J	0.14 J [0.16 J]
p-Isopropyltoluene	99-87-6	- -	10	- -	2.2	0.0041 U	0.47 J	0.0042 U	0.0040 U	2.1 J [2.3 J]
sec-Butylbenzene	135-98-8	11	- -	500	3.3	0.0041 U	0.75 J	0.0042 U	0.0040 U	3.6 J [3.8 J]
Styrene	100-42-5	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
tert-Butylbenzene	98-06-6	5.9	- -	500	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.090 J [0.087 J]
Tertiary butyl alcohol	75-65-0	- -	- -	- -	22 U	0.082 U	6.4 U	0.084 U	0.079 U	6.1 U [5.9 U]
Tetrachloroethene	127-18-4	1.3	- -	150	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Tetrahydrofuran	109-99-9	- -	- -	- -	1.8 U	0.0065 U	0.51 U	0.0067 U	0.0064 U	0.49 U [0.47 U]
Toluene	108-88-3	0.7	- -	500	1.1 U	0.0041 U	0.32 U	0.0042 U	0.00060 J	0.30 U [0.3 U]
trans-1,2-Dichloroethene	156-60-5	0.19	- -	500	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
trans-1,3-Dichloropropene	10061-02-6	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Trichloroethene	79-01-6	0.47	- -	200	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Trichlorofluoromethane	75-69-4	- -	- -	- -	1.1 U	0.0041 U	0.32 U	0.0042 U	0.0040 U	0.30 U [0.3 U]
Vinyl Chloride	75-01-4	0.02	- -	13	*1.1 U*	0.0041 U	*0.32 U*	0.0042 U	0.0040 U	*0.30 U [0.3 U]*
Xylenes (total)	1330-20-7	1.6	- -	500	**49**	0.0019 J	1.5 J	0.0084 U	0.0093	1.1 J [1.4 J]
SVOCs - USEPA SW-846 Method 8270D (mg/kg)										
1,1'-Biphenyl	92-52-4	- -	- -	- -	0.072	0.041 U	0.042 U	0.043 U	0.045 U	0.053 [0.046 U]
1,2,4,5-Tetrachlorobenzene	95-94-3	- -	- -	- -	0.043 U	0.041 U	0.042 U	0.043 U	0.045 U	0.047 U [0.046 U]
1,4-Dioxane	123-91-1	0.1	- -	130	*0.39 U*	*0.38 U*	*0.39 U*	*0.39 U*	*0.41 U*	*0.42 U [0.42 U]*
2,2-Oxybis(1-Chloropropane)	108-60-1	- -	- -	- -	0.051 U	0.049 U	0.050 U	0.051 U	0.053 U	0.055 U [0.054 U]

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-01		B55-PDI-SB-02	B55-PDI-SB-06	B55-PDI-SB-07	B55-PDI-SB-10
Sample Depth (ft):					8 - 10	16 - 16.9	10 - 12	12 - 13	13 - 14	9 - 10
Date Collected:					11/09/20	11/09/20	11/10/20	11/11/20	11/11/20	11/12/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-SB-01 (8-10) 11102020	B55-PDI-SB-01 (16-16.9) 11102020	B55-PDI-SB-02 (10-12) 11102020	B55-PDI-SB-06 (12-13) 11172020	B55-PDI-07 (13-14) 11132020	B55-PDI-SB-10 (9-10) 11182020
SVOCs - USEPA SW-846 Method 8270D (mg/kg) (cont'd)										
2,3,4,6-Tetrachlorophenol	58-90-2	- -	- -	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
2,4,5-Trichlorophenol	95-95-4	- -	0.1	- -	0.079 U	0.075 U	0.077 U	0.079 U	0.082 U	0.085 U [0.083 U]
2,4,6-Trichlorophenol	88-06-2	- -	- -	- -	0.067 U	0.064 U	0.065 U	0.067 U	0.070 U	0.072 U [0.071 U]
2,4-Dichlorophenol	120-83-2	- -	0.4	- -	0.051 U	0.049 U	0.050 U	0.051 U	0.053 U	0.055 U [0.054 U]
2,4-Dimethylphenol	105-67-9	- -	- -	- -	0.079 U	0.075 U	0.077 U	0.079 U	0.082 U	0.085 U [0.083 U]
2,4-Dinitrophenol	51-28-5	- -	0.2	- -	*1.2 U*	*1.1 U*	*1.2 U*	*1.2 U*	*1.2 U*	*1.3 U [1.2 U]*
2,4-Dinitrotoluene	121-14-2	- -	- -	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
2,6-Dinitrotoluene	606-20-2	- -	0.2	- -	0.059 U	0.056 U	0.058 U	0.059 U	0.062 U	0.064 U [0.062 U]
2-Chloronaphthalene	91-58-7	- -	- -	- -	0.039 U	0.038 U	0.039 U	0.039 U	0.041 U	0.042 U [0.042 U]
2-Chlorophenol	95-57-8	- -	- -	- -	0.043 U	0.041 U	0.042 U	0.043 U	0.045 U	0.047 U [0.046 U]
2-Methylnaphthalene	91-57-6	- -	36.4	- -	6.4 D	0.013 J	0.41	0.039 U	0.041 U	0.042 U [0.042 U]
2-Nitroaniline	88-74-4	- -	0.4	- -	0.059 U	0.056 U	0.058 U	0.059 U	0.062 U	0.064 U [0.062 U]
2-Nitrophenol	88-75-5	- -	0.3	- -	0.067 U	0.064 U	0.065 U	0.067 U	0.070 U	0.072 U [0.071 U]
3&4-Methylphenol	65794-96-9	- -	- -	- -	0.059 U	0.056 U	0.058 U	0.059 U	0.062 U	0.064 U [0.062 U]
3,3'-Dichlorobenzidine	91-94-1	- -	- -	- -	0.39 U	0.38 U	0.39 U	0.39 U	0.41 U	0.42 U [0.42 U]
3-Nitroaniline	99-09-2	- -	0.5	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
4,6-Dinitro-2-methylphenol	534-52-1	- -	- -	- -	0.59 U	0.56 U	0.58 U	0.59 U	0.62 U	0.64 U [0.62 U]
4-Bromophenyl-phenylether	101-55-3	- -	- -	- -	0.059 U	0.056 U	0.058 U	0.059 U	0.062 U	0.064 U [0.062 U]
4-Chloro-3-Methylphenol	59-50-7	- -	- -	- -	0.059 U	0.056 U	0.058 U	0.059 U	0.062 U	0.064 U [0.062 U]
4-Chloroaniline	106-47-8	- -	0.22	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
4-Chlorophenyl-phenylether	7005-72-3	- -	- -	- -	0.051 U	0.049 U	0.050 U	0.051 U	0.053 U	0.055 U [0.054 U]
4-Nitroaniline	100-01-6	- -	- -	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
4-Nitrophenol	100-02-7	- -	0.1	- -	*0.59 U*	*0.56 U*	*0.58 U*	*0.59 U*	*0.62 U*	*0.64 U [0.62 U]*
Acenaphthene	83-32-9	98	- -	500	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.021 U]
Acenaphthylene	208-96-8	107	- -	500	0.020 U	0.019 U	0.019 U	0.020 U	0.042	0.021 U [0.021 U]
Acetophenone	98-86-2	- -	- -	- -	0.059 U	0.056 U	0.058 U	0.059 U	0.062 U	0.064 U [0.062 U]
Aniline	62-53-3	- -	0.33	- -	0.59 U	0.56 U	0.58 U	0.59 U	0.62 U	0.64 U [0.62 U]
Anthracene	120-12-7	1,000	- -	500	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.018 J [0.021 U]
Atrazine	1912-24-9	- -	- -	- -	0.51 U	0.49 U	0.50 U	0.51 U	0.53 U	0.55 U [0.54 U]
Benzaldehyde	100-52-7	- -	- -	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
Benzo(a)anthracene	56-55-3	1	- -	5.6	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.021 U]
Benzo(a)pyrene	50-32-8	22	- -	1	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.0057 J]
Benzo(b)fluoranthene	205-99-2	1.7	- -	5.6	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.0074 J]
Benzo(g,h,i)perylene	191-24-2	1,000	- -	500	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.021 U]
Benzo(k)fluoranthene	207-08-9	1.7	- -	56	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.021 U]
Benzyl Alcohol	100-51-6	- -	- -	- -	0.59 U	0.56 U	0.58 U	0.59 U	0.62 U	0.64 U [0.62 U]
bis(2-Chloroethoxy)methane	111-91-1	- -	- -	- -	0.043 U	0.041 U	0.042 U	0.043 U	0.045 U	0.047 U [0.046 U]
bis(2-Chloroethyl)ether	111-44-4	- -	- -	- -	0.059 U	0.056 U	0.058 U	0.059 U	0.062 U	0.064 U [0.062 U]

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-01		B55-PDI-SB-02	B55-PDI-SB-06	B55-PDI-SB-07	B55-PDI-SB-10
Sample Depth (ft):					8 - 10	16 - 16.9	10 - 12	12 - 13	13 - 14	9 - 10
Date Collected:					11/09/20	11/09/20	11/10/20	11/11/20	11/11/20	11/12/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-SB-01 (8-10) 11102020	B55-PDI-SB-01 (16-16.9) 11102020	B55-PDI-SB-02 (10-12) 11102020	B55-PDI-SB-06 (12-13) 11172020	B55-PDI-PDI-07 (13-14) 11132020	B55-PDI-SB-10 (9-10) 11182020
SVOCs - USEPA SW-846 Method 8270D (mg/kg) (cont'd)										
bis(2-Ethylhexyl)phthalate	117-81-7	- -	435	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.31]
Butylbenzylphthalate	85-68-7	- -	122	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
Caprolactam	105-60-2	- -	- -	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
Carbazole	86-74-8	- -	- -	- -	0.043 U	0.041 U	0.042 U	0.043 U	0.045 U	0.047 U [0.046 U]
Chrysene	218-01-9	1	- -	56	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.0094 J]
Dibenzo(a,h)anthracene	53-70-3	1,000	- -	0.56	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.021 U]
Dibenzofuran	132-64-9	210	6.2	350	0.043 U	0.041 U	0.042 U	0.043 U	0.045 U	0.047 U [0.046 U]
Dicyclohexylamine	101-83-7	- -	- -	- -	1.5 J	4.9 D	8.6 D	16 EJ	18 D	21 D [23 D]
Diethylphthalate	84-66-2	- -	7.1	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
Dimethylphthalate	131-11-3	- -	27	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
Di-n-Butylphthalate	84-74-2	- -	8.1	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
Di-n-Octylphthalate	117-84-0	- -	120	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
Fluoranthene	206-44-0	1,000	- -	500	0.0069 J	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.010 J]
Fluorene	86-73-7	386	- -	500	0.033	0.019 U	0.019 U	0.020 U	0.021 U	0.036 [0.026]
Hexachlorobenzene	118-74-1	3.2	1.4	6	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.021 U]
Hexachlorobutadiene	87-68-3	- -	- -	- -	0.090 U	0.087 U	0.089 U	0.091 U	0.094 U	0.098 U [0.096 U]
Hexachlorocyclopentadiene	77-47-4	- -	- -	- -	0.59 U	0.56 U	0.58 U	0.59 U	0.62 U	0.64 U [0.62 U]
Hexachloroethane	67-72-1	- -	- -	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
Indeno(1,2,3-cd)pyrene	193-39-5	8.2	- -	5.6	0.020 U	0.019 U	0.019 U	0.020 U	0.021 U	0.021 U [0.021 U]
Isophorone	78-59-1	- -	4.4	- -	0.043 U	0.041 U	0.042 U	0.043 U	0.045 U	0.047 U [0.046 U]
n,n-dimethylaniline	121-69-7	- -	- -	- -	0.20 U	0.19 U	0.19 U	0.20 UJ	0.21 U	0.21 U [0.21 U]
Naphthalene	91-20-3	12	- -	500	2.9	0.033	0.060	0.020 U	0.0088 J	0.021 U [0.021 U]
Nitrobenzene	98-95-3	- -	0.17	- -	0.079 U	0.075 U	0.077 U	0.079 U	0.082 U	0.085 U [0.083 U]
N-Nitroso-di-n-propylamine	621-64-7	- -	- -	- -	0.059 U	0.056 U	0.058 U	0.059 U	0.062 U	0.064 U [0.062 U]
N-Nitrosodiphenylamine	86-30-6	- -	- -	- -	0.043 U	0.041 U	0.042 U	0.043 U	0.045 U	0.047 U [0.046 U]
o-Cresol (2-Methylphenol)	95-48-7	0.33	- -	500	0.079 U	0.075 U	0.077 U	0.079 U	0.082 U	0.085 U [0.083 U]
Pentachlorophenol	87-86-5	0.8	- -	6.7	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
Phenanthrene	85-01-8	1,000	- -	500	0.059	0.019 U	0.014 J	0.020 U	0.021 U	0.084 [0.061]
Phenol	108-95-2	0.33	- -	500	0.043 U	0.041 U	0.042 U	0.043 U	0.045 U	0.047 U [0.046 U]
Pyrene	129-00-0	1,000	- -	500	0.011 J	0.019 U	0.019 U	0.020 U	0.021 U	0.025 [0.022]
Pyridine	110-86-1	- -	- -	- -	0.20 U	0.19 U	0.19 U	0.20 U	0.21 U	0.21 U [0.21 U]
Triethylamine	121-44-8	- -	- -	- -	5.9 UJ	5.6 UJ	5.8 UJ	5.9 UJ	6.2 UJ	6.4 UJ [6.2 UJ]
Aldehydes - USEPA SW-846 Method 8315A (mg/kg)										
Acetaldehyde	75-07-0	- -	- -	- -	0.059 UJ	0.057 UJ	0.059 UJ	0.060 UJ	0.048 J	0.064 U [0.036 J]
Formaldehyde	50-00-0	- -	- -	- -	0.17 J	0.1 J	0.081 J	0.12 J	0.27	0.27 J [1.2 J]
Glutaraldehyde	111-30-8	- -	- -	- -	0.059 UJ	0.057 UJ	0.059 UJ	0.060 UJ	0.062 U	0.064 U [0.063 U]

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-11	B55-PDI-SB-13		B55-PDI-SB-15	B55-PDI-SB-17	
Sample Depth (ft):					5 - 6	6 - 8	12 - 12.5	8 - 9	8 - 9	9 - 10
Date Collected:					11/12/20	11/13/20	11/13/20	11/13/20	11/16/20	11/16/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-11 (5-6) 11132020	B55-PDI-13 (6-8) 11132020	B55-PDI-13 (12-12.5) 11132020	B55-PDI-SB-15 (8-9) 11132020	B55-PDI-SB-17 (8-9) 11172020	B55-PDI-SB-17 (9-10) 11172020
VOCs - USEPA SW-486 Method 8260C (mg/kg)										
1,1,1-Trichloroethane	71-55-6	0.68	- -	500	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,1,2,2-Tetrachloroethane	79-34-5	- -	0.6	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	- -	6	- -	0.52 U	0.50 U	0.0069 U	0.0079 U	0.58 U	0.0080 U
1,1,2-Trichloroethane	79-00-5	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,1-Dichloroethane	75-34-3	0.27	- -	240	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,1-Dichloroethene	75-35-4	0.33	- -	500	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,2,3-Trichlorobenzene	87-61-6	- -	- -	- -	0.52 U	0.50 U	0.0069 U	0.0079 U	0.58 U	0.0080 U
1,2,4-Trichlorobenzene	120-82-1	- -	3.4	- -	0.52 U	0.50 U	0.0069 U	0.0079 U	0.58 U	0.0080 U
1,2,4-Trimethylbenzene	95-63-6	3.6	- -	190	2.9	0.12 J	0.095 J	0.0040 U	0.29 U	0.0040 U
1,2-Dibromo-3-chloropropane	96-12-8	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,2-Dibromoethane	106-93-4	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,2-Dichlorobenzene	95-50-1	1.1	- -	500	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,2-Dichloroethane	107-06-2	0.02	- -	30	*0.26 U*	*0.25 U*	0.0034 U	0.0040 U	*0.29 U*	0.0040 U
1,2-Dichloropropane	78-87-5	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,3,5-Trimethylbenzene	108-67-8	8.4	- -	190	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,3-Dichlorobenzene	541-73-1	2.4	- -	280	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,4-Dichlorobenzene	106-46-7	1.8	- -	130	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
1,4-Dioxane	123-91-1	0.1	- -	130	*13 U*	*13 U*	*0.17 U*	*0.20 U*	*15 U*	*0.20 U*
2-Hexanone	591-78-6	- -	- -	- -	0.52 U	0.50 U	0.0069 U	0.0079 U	0.58 U	0.0080 U
2-Nitropropane	79-46-9	- -	- -	- -	R	R	0.0069 U	0.0079 U	R	0.0080 U
Acetone	67-64-1	0.05	- -	500	*1.0 U*	*1.0 U*	0.019 J	**0.080**	*1.2 U*	0.039
Acetonitrile	75-05-8	- -	- -	- -	5.2 U	5.0 U	0.069 U	0.079 U	5.8 U	0.080 U
Benzene	71-43-2	0.06	- -	44	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Bromochloromethane	74-97-5	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Bromodichloromethane	75-27-4	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Bromoform	75-25-2	- -	- -	- -	0.52 U	0.50 UJ	0.0069 U	0.0079 U	0.58 U	0.0080 U
Bromomethane	74-83-9	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Carbon Disulfide	75-15-0	- -	2.7	- -	0.26 U	0.25 U	0.0036 J	0.00098 J	0.29 U	0.0040 U
Carbon Tetrachloride	56-23-5	0.76	- -	22	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Chlorobenzene	108-90-7	1.1	- -	500	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Chlorodifluoromethane	75-45-6	- -	- -	- -	0.52 U	0.50 U	0.0069 U	0.0079 U	0.58 U	0.0080 U
Chloroethane	75-00-3	- -	1.9	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Chloroform	67-66-3	0.37	- -	350	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Chloromethane	74-87-3	- -	- -	- -	0.26 UJ	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
cis-1,2-Dichloroethene	156-59-2	0.25	- -	500	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
cis-1,3-Dichloropropene	10061-01-5	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Cyclohexane	110-82-7	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Cyclohexanone	108-94-1	- -	- -	- -	13 U	13 U	0.44 J	2.2	15 U	0.10 J

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-11	B55-PDI-SB-13		B55-PDI-SB-15	B55-PDI-SB-17	
Sample Depth (ft):					5 - 6	6 - 8	12 - 12.5	8 - 9	8 - 9	9 - 10
Date Collected:					11/12/20	11/13/20	11/13/20	11/13/20	11/16/20	11/16/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-11 (5-6) 11132020	B55-PDI-13 (6-8) 11132020	B55-PDI-13 (12-12.5) 11132020	B55-PDI-SB-15 (8-9) 11132020	B55-PDI-SB-17 (8-9) 11172020	B55-PDI-SB-17 (9-10) 11172020
VOCs - USEPA SW-486 Method 8260C (mg/kg) (cont'd)										
Dibromochloromethane	124-48-1	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Dichlorodifluoromethane	75-71-8	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Ethyl acetate	141-78-6	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Ethyl ether	60-29-7	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Ethylbenzene	100-41-4	1	- -	390	0.12 J	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Isobutanol	78-83-1	- -	- -	- -	13 U	13 U	0.17 U	0.20 U	15 U	0.20 U
Isopropylbenzene	98-82-8	- -	2.3	- -	0.23 J	0.25 U	0.0025 J	0.0040 U	0.29 U	0.0040 U
m,p-Xylene	ARC-mpXyl	- -	- -	- -	0.059 J	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Methyl acetate	79-20-9	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Methyl ethyl ketone (MEK, 2-butanone)	78-93-3	0.12	0.3	500	0.52 UJ	0.50 UJ	0.013 J	0.0038 J	0.58 U	0.0025 J
Methyl isobutyl ketone (MIBK, 4-methyl-2-pentanone)	108-10-1	- -	1	- -	0.52 U	0.50 U	0.0069 U	0.0079 U	0.58 U	0.0080 U
Methyl tert-butyl ether	1634-04-4	0.93	- -	500	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Methylcyclohexane	108-87-2	- -	- -	- -	0.26 U	0.25 U	0.021 J	0.0040 U	0.29 U	0.0040 U
Methylene Chloride	75-09-2	0.05	- -	500	*0.26 U*	*0.25 U*	0.0034 U	0.0040 U	*0.29 U*	0.0040 U
Naphthalene	91-20-3	12	- -	500	0.26 U	0.25 U	0.0021 J	0.0021 J	0.29 U	0.0040 U
n-Butanol	71-36-3	- -	- -	- -	13 U	13 U	0.17 U	0.20 U	15 U	0.20 U
n-Butylbenzene	104-51-8	12	- -	500	1.7	0.33 J	0.021 J	0.0063 U	0.47 U	0.0064 U
N-Heptane	142-82-5	- -	- -	- -	0.42 U	0.40 U	0.0055 U	0.0063 U	0.47 U	0.0064 U
o-Xylene	95-47-6	- -	- -	- -	0.26 U	0.25 U	0.00030 J	0.0040 U	0.29 U	0.0040 U
p-Isopropyltoluene	99-87-6	- -	10	- -	0.43	0.25 U	0.011 J	0.0040 U	0.29 U	0.0040 U
sec-Butylbenzene	135-98-8	11	- -	500	0.71	0.25 U	0.0090 J	0.0040 U	0.29 U	0.0040 U
Styrene	100-42-5	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
tert-Butylbenzene	98-06-6	5.9	- -	500	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Tertiary butyl alcohol	75-65-0	- -	- -	- -	5.2 U	5.0 U	0.069 U	0.044 J	5.8 U	0.033 J
Tetrachloroethene	127-18-4	1.3	- -	150	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Tetrahydrofuran	109-99-9	- -	- -	- -	0.42 U	0.40 U	0.0055 U	0.0063 U	0.47 U	0.0064 U
Toluene	108-88-3	0.7	- -	500	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
trans-1,2-Dichloroethene	156-60-5	0.19	- -	500	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
trans-1,3-Dichloropropene	10061-02-6	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Trichloroethene	79-01-6	0.47	- -	200	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Trichlorofluoromethane	75-69-4	- -	- -	- -	0.26 U	0.25 U	0.0034 U	0.0040 U	0.29 U	0.0040 U
Vinyl Chloride	75-01-4	0.02	- -	13	*0.26 U*	*0.25 U*	0.0034 U	0.0040 U	*0.29 U*	0.0040 U
Xylenes (total)	1330-20-7	1.6	- -	500	0.52 U	0.50 U	0.0069 U	0.0079 U	0.58 U	0.0080 U
SVOCs - USEPA SW-846 Method 8270D (mg/kg)										
1,1'-Biphenyl	92-52-4	- -	- -	- -	0.043 U	0.044 U	0.040 U	0.044 U	0.044 U	0.043 U
1,2,4,5-Tetrachlorobenzene	95-94-3	- -	- -	- -	0.043 U	0.044 U	0.040 U	0.044 U	0.044 U	0.043 U
1,4-Dioxane	123-91-1	0.1	- -	130	*0.39 U*	*0.40 U*	*0.36 U*	*0.40 U*	*0.40 U*	*0.39 U*
2,2-Oxybis(1-Chloropropane)	108-60-1	- -	- -	- -	0.050 U	0.052 U	0.047 U	0.052 U	0.052 U	0.051 U

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-11	B55-PDI-SB-13		B55-PDI-SB-15	B55-PDI-SB-17	
Sample Depth (ft):					5 - 6	6 - 8	12 - 12.5	8 - 9	8 - 9	9 - 10
Date Collected:					11/12/20	11/13/20	11/13/20	11/13/20	11/16/20	11/16/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-11 (5-6) 11132020	B55-PDI-13 (6-8) 11132020	B55-PDI-13 (12-12.5) 11132020	B55-PDI-SB-15 (8-9) 11132020	B55-PDI-SB-17 (8-9) 11172020	B55-PDI-SB-17 (9-10) 11172020
SVOCs - USEPA SW-846 Method 8270D (mg/kg) (cont'd)										
2,3,4,6-Tetrachlorophenol	58-90-2	- -	- -	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
2,4,5-Trichlorophenol	95-95-4	- -	0.1	- -	0.077 U	0.080 U	0.073 U	0.080 U	0.081 U	0.078 U
2,4,6-Trichlorophenol	88-06-2	- -	- -	- -	0.066 U	0.068 U	0.062 U	0.068 U	0.068 U	0.067 U
2,4-Dichlorophenol	120-83-2	- -	0.4	- -	0.050 U	0.052 U	0.047 U	0.052 U	0.052 U	0.051 U
2,4-Dimethylphenol	105-67-9	- -	- -	- -	0.077 U	0.080 U	0.073 U	0.080 U	0.081 U	0.078 U
2,4-Dinitrophenol	51-28-5	- -	0.2	- -	*1.2 U*	*1.2 U*	*1.1 U*	*1.2 U*	*1.2 U*	*1.2 U*
2,4-Dinitrotoluene	121-14-2	- -	- -	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
2,6-Dinitrotoluene	606-20-2	- -	0.2	- -	0.058 U	0.060 U	0.054 U	0.060 U	0.060 U	0.059 U
2-Chloronaphthalene	91-58-7	- -	- -	- -	0.039 U	0.040 U	0.036 U	0.040 U	0.040 U	0.039 U
2-Chlorophenol	95-57-8	- -	- -	- -	0.043 U	0.044 U	0.040 U	0.044 U	0.044 U	0.043 U
2-Methylnaphthalene	91-57-6	- -	36.4	- -	0.039 U	0.040 U	0.036 U	0.040 U	0.040 U	0.039 U
2-Nitroaniline	88-74-4	- -	0.4	- -	0.058 U	0.060 U	0.054 U	0.060 U	0.060 U	0.059 U
2-Nitrophenol	88-75-5	- -	0.3	- -	0.066 U	0.068 U	0.062 U	0.068 U	0.068 U	0.067 U
3&4-Methylphenol	65794-96-9	- -	- -	- -	0.058 U	0.060 U	0.054 U	0.060 U	0.060 U	0.059 U
3,3'-Dichlorobenzidine	91-94-1	- -	- -	- -	0.39 U	0.40 U	0.36 U	0.40 U	0.40 U	0.39 U
3-Nitroaniline	99-09-2	- -	0.5	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
4,6-Dinitro-2-methylphenol	534-52-1	- -	- -	- -	0.58 U	0.60 U	0.54 U	0.60 U	0.60 U	0.59 U
4-Bromophenyl-phenylether	101-55-3	- -	- -	- -	0.058 U	0.060 U	0.054 U	0.060 U	0.060 U	0.059 U
4-Chloro-3-Methylphenol	59-50-7	- -	- -	- -	0.058 U	0.060 U	0.054 U	0.060 U	0.060 U	0.059 U
4-Chloroaniline	106-47-8	- -	0.22	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
4-Chlorophenyl-phenylether	7005-72-3	- -	- -	- -	0.050 U	0.052 U	0.047 U	0.052 U	0.052 U	0.051 U
4-Nitroaniline	100-01-6	- -	- -	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
4-Nitrophenol	100-02-7	- -	0.1	- -	*0.58 U*	*0.60 U*	*0.54 U*	*0.60 U*	*0.60 U*	*0.59 U*
Acenaphthene	83-32-9	98	- -	500	0.019 U	0.020 U	0.018 U	0.020 U	0.020 U	0.020 U
Acenaphthylene	208-96-8	107	- -	500	0.019 U	0.020 U	0.018 U	0.020 U	0.020 U	0.020 U
Acetophenone	98-86-2	- -	- -	- -	0.058 U	0.060 U	0.054 U	0.060 U	0.060 U	0.059 U
Aniline	62-53-3	- -	0.33	- -	0.58 U	0.60 U	0.54 U	0.60 U	0.60 U	0.59 U
Anthracene	120-12-7	1,000	- -	500	0.019 U	0.0079 J	0.0060 J	0.020 U	0.020 U	0.020 U
Atrazine	1912-24-9	- -	- -	- -	0.50 U	0.52 U	0.47 U	0.52 U	0.52 U	0.51 U
Benzaldehyde	100-52-7	- -	- -	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Benzo(a)anthracene	56-55-3	1	- -	5.6	0.019 U	0.020 U	0.019	0.020 U	0.020 U	0.020 U
Benzo(a)pyrene	50-32-8	22	- -	1	0.019 U	0.020 U	0.016 J	0.0061 J	0.020 U	0.020 U
Benzo(b)fluoranthene	205-99-2	1.7	- -	5.6	0.019 U	0.020 U	0.017 J	0.0058 J	0.020 U	0.020 U
Benzo(g,h,i)perylene	191-24-2	1,000	- -	500	0.019 U	0.020 U	0.0050 J	0.020 U	0.020 U	0.020 U
Benzo(k)fluoranthene	207-08-9	1.7	- -	56	0.019 U	0.020 U	0.010 J	0.020 U	0.020 U	0.020 U
Benzyl Alcohol	100-51-6	- -	- -	- -	0.58 U	0.60 U	0.54 U	0.60 U	0.60 U	0.59 U
bis(2-Chloroethoxy)methane	111-91-1	- -	- -	- -	0.043 U	0.044 U	0.040 U	0.044 U	0.044 U	0.043 U
bis(2-Chloroethyl)ether	111-44-4	- -	- -	- -	0.058 U	0.060 U	0.054 U	0.060 U	0.060 U	0.059 U

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-11	B55-PDI-SB-13		B55-PDI-SB-15	B55-PDI-SB-17	
Sample Depth (ft):					5 - 6	6 - 8	12 - 12.5	8 - 9	8 - 9	9 - 10
Date Collected:					11/12/20	11/13/20	11/13/20	11/13/20	11/16/20	11/16/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-11 (5-6) 11132020	B55-PDI-13 (6-8) 11132020	B55-PDI-13 (12-12.5) 11132020	B55-PDI-15 (8-9) 11132020	B55-PDI-17 (8-9) 11172020	B55-PDI-17 (9-10) 11172020
SVOCs - USEPA SW-846 Method 8270D (mg/kg) (cont'd)										
bis(2-Ethylhexyl)phthalate	117-81-7	- -	435	- -	0.19 U	0.20 U	0.17 J	0.20 U	0.20 U	0.20 U
Butylbenzylphthalate	85-68-7	- -	122	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Caprolactam	105-60-2	- -	- -	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Carbazole	86-74-8	- -	- -	- -	0.043 U	0.044 U	0.040 U	0.044 U	0.044 U	0.043 U
Chrysene	218-01-9	1	- -	56	0.019 U	0.020 U	0.014 J	0.0052 J	0.020 U	0.020 U
Dibenzo(a,h)anthracene	53-70-3	1,000	- -	0.56	0.019 U	0.020 U	0.018 U	0.020 U	0.020 U	0.020 U
Dibenzofuran	132-64-9	210	6.2	350	0.043 U	0.044 U	0.040 U	0.044 U	0.044 U	0.043 U
Dicyclohexylamine	101-83-7	- -	- -	- -	1.7 J	43 D	4.9 D	5.0 D	15 EJ	4.7 J
Diethylphthalate	84-66-2	- -	7.1	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Dimethylphthalate	131-11-3	- -	27	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Di-n-Butylphthalate	84-74-2	- -	8.1	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Di-n-Octylphthalate	117-84-0	- -	120	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Fluoranthene	206-44-0	1,000	- -	500	0.019 U	0.020 U	0.039	0.013 J	0.020 U	0.020 U
Fluorene	86-73-7	386	- -	500	0.019 U	0.020 U	0.018 U	0.020 U	0.020 U	0.020 U
Hexachlorobenzene	118-74-1	3.2	1.4	6	0.019 U	0.020 U	0.018 U	0.020 U	0.020 U	0.020 U
Hexachlorobutadiene	87-68-3	- -	- -	- -	0.089 U	0.092 U	0.083 U	0.091 U	0.093 U	0.090 U
Hexachlorocyclopentadiene	77-47-4	- -	- -	- -	0.58 U	0.60 U	0.54 U	0.60 U	0.60 U	0.59 U
Hexachloroethane	67-72-1	- -	- -	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Indeno(1,2,3-cd)pyrene	193-39-5	8.2	- -	5.6	0.019 U	0.020 U	0.0055 J	0.020 U	0.020 U	0.020 U
Isophorone	78-59-1	- -	4.4	- -	0.043 U	0.044 U	0.040 U	0.044 U	0.044 U	0.043 U
n,n-dimethylaniline	121-69-7	- -	- -	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 UJ	0.19 UJ
Naphthalene	91-20-3	12	- -	500	0.019 U	0.020 U	0.018 U	0.020 U	0.010 J	0.020 U
Nitrobenzene	98-95-3	- -	0.17	- -	0.077 U	0.080 U	0.073 U	0.080 U	0.081 U	0.078 U
N-Nitroso-di-n-propylamine	621-64-7	- -	- -	- -	0.058 U	0.060 U	0.054 U	0.060 U	0.060 U	0.059 U
N-Nitrosodiphenylamine	86-30-6	- -	- -	- -	0.043 U	0.044 U	0.040 U	0.044 U	0.044 U	0.043 U
o-Cresol (2-Methylphenol)	95-48-7	0.33	- -	500	0.077 U	0.080 U	0.073 U	0.080 U	0.081 U	0.078 U
Pentachlorophenol	87-86-5	0.8	- -	6.7	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Phenanthrene	85-01-8	1,000	- -	500	0.0086 J	0.0071 J	0.018	0.0040 J	0.020 U	0.020 U
Phenol	108-95-2	0.33	- -	500	0.043 U	0.044 U	0.040 U	0.044 U	0.044 U	0.043 U
Pyrene	129-00-0	1,000	- -	500	0.0069 J	0.017 J	0.040	0.0099 J	0.0054 J	0.020 U
Pyridine	110-86-1	- -	- -	- -	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Triethylamine	121-44-8	- -	- -	- -	5.8 UJ	6.0 UJ	5.4 UJ	6.0 UJ	6.0 UJ	5.8 UJ
Aldehydes - USEPA SW-846 Method 8315A (mg/kg)										
Acetaldehyde	75-07-0	- -	- -	- -	0.059 U	0.058 J	0.055 U	0.059 J	0.060 UJ	0.059 U
Formaldehyde	50-00-0	- -	- -	- -	0.47	1.4 D	0.12	0.39	0.22 J	0.12
Glutaraldehyde	111-30-8	- -	- -	- -	0.059 U	0.060 U	0.055 U	0.060 U	0.060 UJ	0.059 U

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-18		B55-PDI-SB-19		B55-PDI-SB-21	B55-PDI-SB-22
Sample Depth (ft):					9.5 - 10.5	10.7 - 11.7	11.6 - 12.6	12.6 - 13.6	4.5 - 5.5	5.2- 6.2
Date Collected:					11/16/20	11/16/20	11/16/20	11/16/20	11/17/20	11/17/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-SB-18 (9.5-10.5) 11172020	B55-PDI-SB-18 (10.7-11.7) 11172020	B55-PDI-SB-19 (11.6-12.6) 11172020	B55-PDI-SB-19 (12.6-13.6) 11172020	B55-PDI-SB-21 (4.5-5.5) 11172020	B55-PDI-SB-22 (5.2-6.2) 11182020
VOCs - USEPA SW-486 Method 8260C (mg/kg)										
1,1,1-Trichloroethane	71-55-6	0.68	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
1,1,2,2-Tetrachloroethane	79-34-5	- -	0.6	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	- -	6	- -	0.62 U	0.0097 U	0.0091 U	0.0091 U	0.0076 U	0.0092 U
1,1,2-Trichloroethane	79-00-5	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
1,1-Dichloroethane	75-34-3	0.27	- -	240	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
1,1-Dichloroethene	75-35-4	0.33	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
1,2,3-Trichlorobenzene	87-61-6	- -	- -	- -	0.62 U	0.0097 U	0.0091 U	0.0091 U	0.0076 U	0.0092 U
1,2,4-Trichlorobenzene	120-82-1	- -	3.4	- -	0.62 U	0.0097 U	0.0091 U	0.0091 U	0.0076 U	0.0092 U
1,2,4-Trimethylbenzene	95-63-6	3.6	- -	190	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
1,2-Dibromo-3-chloropropane	96-12-8	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
1,2-Dibromoethane	106-93-4	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
1,2-Dichlorobenzene	95-50-1	1.1	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
1,2-Dichloroethane	107-06-2	0.02	- -	30	*0.31 U*	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
1,2-Dichloropropane	78-87-5	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
1,3,5-Trimethylbenzene	108-67-8	8.4	- -	190	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
1,3-Dichlorobenzene	541-73-1	2.4	- -	280	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
1,4-Dichlorobenzene	106-46-7	1.8	- -	130	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
1,4-Dioxane	123-91-1	0.1	- -	130	*15 U*	*0.24 U*	*0.23 U*	*0.23 U*	*0.19 U*	*0.23 U*
2-Hexanone	591-78-6	- -	- -	- -	0.62 U	0.0097 U	0.0091 U	0.0091 U	0.0076 U	0.0092 U
2-Nitropropane	79-46-9	- -	- -	- -	R	0.0097 U	0.0091 U	0.0091 U	0.0076 U	0.0092 U
Acetone	67-64-1	0.05	- -	500	*1.2 U*	0.023	0.035	**0.071**	0.022	0.028 J
Acetonitrile	75-05-8	- -	- -	- -	6.2 U	0.097 U	0.091 U	0.091 U	0.076 U	0.092 U
Benzene	71-43-2	0.06	- -	44	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Bromochloromethane	74-97-5	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Bromodichloromethane	75-27-4	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Bromoform	75-25-2	- -	- -	- -	0.62 U	0.0097 U	0.0091 U	0.0091 U	0.0076 U	0.0092 U
Bromomethane	74-83-9	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Carbon Disulfide	75-15-0	- -	2.7	- -	0.31 U	0.0048 U	0.0017 J	0.0046 U	0.0038 U	0.00070 J
Carbon Tetrachloride	56-23-5	0.76	- -	22	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Chlorobenzene	108-90-7	1.1	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
Chlorodifluoromethane	75-45-6	- -	- -	- -	0.62 U	0.0097 U	0.0091 U	0.0091 U	0.0076 U	0.0092 UJ
Chloroethane	75-00-3	- -	1.9	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Chloroform	67-66-3	0.37	- -	350	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Chloromethane	74-87-3	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
cis-1,2-Dichloroethene	156-59-2	0.25	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
cis-1,3-Dichloropropene	10061-01-5	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Cyclohexane	110-82-7	- -	- -	- -	0.31 U	0.0048 U	0.0067	0.0046 U	0.0038 U	0.0046 U
Cyclohexanone	108-94-1	- -	- -	- -	15 U	0.24 U	0.23 U	0.23 U	0.19 U	0.23 U

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-18		B55-PDI-SB-19		B55-PDI-SB-21	B55-PDI-SB-22
Sample Depth (ft):					9.5 - 10.5	10.7 - 11.7	11.6 - 12.6	12.6 - 13.6	4.5 - 5.5	5.2- 6.2
Date Collected:					11/16/20	11/16/20	11/16/20	11/16/20	11/17/20	11/17/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-SB-18 (9.5-10.5) 11172020	B55-PDI-SB-18 (10.7-11.7) 11172020	B55-PDI-SB-19 (11.6-12.6) 11172020	B55-PDI-SB-19 (12.6-13.6) 11172020	B55-PDI-SB-21 (4.5-5.5) 11172020	B55-PDI-SB-22 (5.2-6.2) 11182020
VOCs - USEPA SW-486 Method 8260C (mg/kg) (cont'd)										
Dibromochloromethane	124-48-1	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Dichlorodifluoromethane	75-71-8	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Ethyl acetate	141-78-6	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Ethyl ether	60-29-7	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Ethylbenzene	100-41-4	1	- -	390	0.31 U	0.0048 U	0.00079 J	0.0046 U	0.0038 U	0.0046 UJ
Isobutanol	78-83-1	- -	- -	- -	15 U	0.24 U	0.23 U	0.23 U	0.19 U	0.23 U
Isopropylbenzene	98-82-8	- -	2.3	- -	0.31 U	0.0048 U	0.00066 J	0.0046 U	0.0038 U	0.0046 UJ
m,p-Xylene	ARC-mpXyl	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
Methyl acetate	79-20-9	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Methyl ethyl ketone (MEK, 2-butanone)	78-93-3	0.12	0.3	500	0.62 U	0.0097 U	0.0023 J	0.0026 J	0.0076 U	0.0020 J
Methyl isobutyl ketone (MIBK, 4-methyl-2-pentanone)	108-10-1	- -	1	- -	0.62 U	0.0097 U	0.0091 U	0.0091 U	0.0076 U	0.0092 U
Methyl tert-butyl ether	1634-04-4	0.93	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Methylcyclohexane	108-87-2	- -	- -	- -	0.55	0.0048 U	0.0021 J	0.0046 U	0.0038 U	0.0046 U
Methylene Chloride	75-09-2	0.05	- -	500	*0.31 U*	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Naphthalene	91-20-3	12	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
n-Butanol	71-36-3	- -	- -	- -	15 U	0.24 U	0.23 U	0.23 U	0.19 U	0.23 U
n-Butylbenzene	104-51-8	12	- -	500	0.49 U	0.0077 U	0.0073 U	0.0073 U	0.0061 U	0.0073 UJ
N-Heptane	142-82-5	- -	- -	- -	0.86	0.0077 U	0.0073 U	0.0073 U	0.0061 U	0.0073 U
o-Xylene	95-47-6	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
p-Isopropyltoluene	99-87-6	- -	10	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
sec-Butylbenzene	135-98-8	11	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
Styrene	100-42-5	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
tert-Butylbenzene	98-06-6	5.9	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 UJ
Tertiary butyl alcohol	75-65-0	- -	- -	- -	6.2 U	0.097 U	0.015 J	0.073 J	0.076 U	0.092 U
Tetrachloroethene	127-18-4	1.3	- -	150	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Tetrahydrofuran	109-99-9	- -	- -	- -	0.49 U	0.0077 U	0.0073 U	0.0073 U	0.0061 U	0.0073 U
Toluene	108-88-3	0.7	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 UB	0.0046 U
trans-1,2-Dichloroethene	156-60-5	0.19	- -	500	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
trans-1,3-Dichloropropene	10061-02-6	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Trichloroethene	79-01-6	0.47	- -	200	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Trichlorofluoromethane	75-69-4	- -	- -	- -	0.31 U	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Vinyl Chloride	75-01-4	0.02	- -	13	*0.31 U*	0.0048 U	0.0046 U	0.0046 U	0.0038 U	0.0046 U
Xylenes (total)	1330-20-7	1.6	- -	500	0.62 U	0.0097 U	0.0091 U	0.0091 U	0.0076 U	0.0092 UJ
SVOCs - USEPA SW-846 Method 8270D (mg/kg)										
1,1'-Biphenyl	92-52-4	- -	- -	- -	0.045 U	0.045 U	0.045 U	0.046 U	0.042 U	0.045 U
1,2,4,5-Tetrachlorobenzene	95-94-3	- -	- -	- -	0.045 U	0.045 U	0.045 U	0.046 U	0.042 U	0.045 U
1,4-Dioxane	123-91-1	0.1	- -	130	*0.41 U*	*0.41 U*	*0.41 U*	*0.42 U*	*0.38 U*	*0.41 U*
2,2-Oxybis(1-Chloropropane)	108-60-1	- -	- -	- -	0.054 U	0.053 U	0.053 U	0.055 U	0.050 U	0.053 U

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-18		B55-PDI-SB-19		B55-PDI-SB-21	B55-PDI-SB-22
Sample Depth (ft):					9.5 - 10.5	10.7 - 11.7	11.6 - 12.6	12.6 - 13.6	4.5 - 5.5	5.2- 6.2
Date Collected:					11/16/20	11/16/20	11/16/20	11/16/20	11/17/20	11/17/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-SB-18 (9.5-10.5) 11172020	B55-PDI-SB-18 (10.7-11.7) 11172020	B55-PDI-SB-19 (11.6-12.6) 11172020	B55-PDI-SB-19 (12.6-13.6) 11172020	B55-PDI-SB-21 (4.5-5.5) 11172020	B55-PDI-SB-22 (5.2-6.2) 11182020
SVOCs - USEPA SW-846 Method 8270D (mg/kg) (cont'd)										
2,3,4,6-Tetrachlorophenol	58-90-2	- -	- -	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
2,4,5-Trichlorophenol	95-95-4	- -	0.1	- -	0.083 U	0.082 U	0.081 U	0.084 U	0.076 U	0.081 U
2,4,6-Trichlorophenol	88-06-2	- -	- -	- -	0.070 U	0.070 U	0.069 U	0.072 U	0.065 U	0.069 U
2,4-Dichlorophenol	120-83-2	- -	0.4	- -	0.054 U	0.053 U	0.053 U	0.055 U	0.050 U	0.053 U
2,4-Dimethylphenol	105-67-9	- -	- -	- -	0.083 U	0.082 U	0.081 U	0.084 U	0.076 U	0.081 UJ
2,4-Dinitrophenol	51-28-5	- -	0.2	- -	*1.2 U*	*1.2 U*	*1.2 UJ*	*1.3 U*	*1.1 U*	*1.2 UJ*
2,4-Dinitrotoluene	121-14-2	- -	- -	- -	0.21 U	0.21 U	0.20 UJ	0.21 U	0.19 U	0.20 U
2,6-Dinitrotoluene	606-20-2	- -	0.2	- -	0.062 U	0.062 U	0.061 UJ	0.063 U	0.057 U	0.061 U
2-Chloronaphthalene	91-58-7	- -	- -	- -	0.041 U	0.041 U	0.041 U	0.042 U	0.038 U	0.041 U
2-Chlorophenol	95-57-8	- -	- -	- -	0.045 U	0.045 U	0.045 U	0.046 U	0.042 U	0.045 U
2-Methylnaphthalene	91-57-6	- -	36.4	- -	0.0061 J	0.041 U	0.041 U	0.042 U	0.038 U	0.0042 J
2-Nitroaniline	88-74-4	- -	0.4	- -	0.062 U	0.062 U	0.061 UJ	0.063 U	0.057 U	0.061 U
2-Nitrophenol	88-75-5	- -	0.3	- -	0.070 U	0.070 U	0.069 UJ	0.072 U	0.065 U	0.069 UJ
3&4-Methylphenol	65794-96-9	- -	- -	- -	0.062 U	0.062 U	0.061 U	0.063 U	0.057 U	0.061 U
3,3'-Dichlorobenzidine	91-94-1	- -	- -	- -	0.41 U	0.41 U	0.41 U	0.42 U	0.38 U	0.41 UJ
3-Nitroaniline	99-09-2	- -	0.5	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
4,6-Dinitro-2-methylphenol	534-52-1	- -	- -	- -	0.62 U	0.62 U	0.61 UJ	0.63 U	0.57 U	0.61 UJ
4-Bromophenyl-phenylether	101-55-3	- -	- -	- -	0.062 U	0.062 U	0.061 U	0.063 U	0.057 U	0.061 U
4-Chloro-3-Methylphenol	59-50-7	- -	- -	- -	0.062 U	0.062 U	0.061 U	0.063 U	0.057 U	0.061 U
4-Chloroaniline	106-47-8	- -	0.22	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
4-Chlorophenyl-phenylether	7005-72-3	- -	- -	- -	0.054 U	0.053 U	0.053 U	0.055 U	0.050 U	0.053 U
4-Nitroaniline	100-01-6	- -	- -	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
4-Nitrophenol	100-02-7	- -	0.1	- -	*0.62 U*	*0.62 U*	*0.61 U*	*0.63 U*	*0.57 U*	*0.61 U*
Acenaphthene	83-32-9	98	- -	500	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Acenaphthylene	208-96-8	107	- -	500	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Acetophenone	98-86-2	- -	- -	- -	0.062 U	0.062 U	0.061 U	0.063 U	0.057 U	0.061 U
Aniline	62-53-3	- -	0.33	- -	0.62 U	0.62 U	0.61 U	0.63 U	0.57 U	0.61 U
Anthracene	120-12-7	1,000	- -	500	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Atrazine	1912-24-9	- -	- -	- -	0.54 U	0.53 U	0.53 U	0.55 U	0.50 U	0.53 U
Benzaldehyde	100-52-7	- -	- -	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
Benzo(a)anthracene	56-55-3	1	- -	5.6	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Benzo(a)pyrene	50-32-8	22	- -	1	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Benzo(b)fluoranthene	205-99-2	1.7	- -	5.6	0.021 U	0.021 U	0.020 U	0.021 U	0.0044 J	0.020 U
Benzo(g,h,i)perylene	191-24-2	1,000	- -	500	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Benzo(k)fluoranthene	207-08-9	1.7	- -	56	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Benzyl Alcohol	100-51-6	- -	- -	- -	0.62 U	0.62 U	0.61 U	0.63 U	0.57 U	0.61 U
bis(2-Chloroethoxy)methane	111-91-1	- -	- -	- -	0.045 U	0.045 U	0.045 U	0.046 U	0.042 U	0.045 U
bis(2-Chloroethyl)ether	111-44-4	- -	- -	- -	0.062 U	0.062 U	0.061 U	0.063 U	0.057 U	0.061 U

See Notes on Page 21.

Table 2A
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:					B55-PDI-SB-18		B55-PDI-SB-19		B55-PDI-SB-21	B55-PDI-SB-22
Sample Depth (ft):					9.5 - 10.5	10.7 - 11.7	11.6 - 12.6	12.6 - 13.6	4.5 - 5.5	5.2- 6.2
Date Collected:					11/16/20	11/16/20	11/16/20	11/16/20	11/17/20	11/17/20
Sample Name:	CAS Number	Restricted Use SCOs - Protection of Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCOs Commercial	B55-PDI-SB-18 (9.5-10.5) 11172020	B55-PDI-SB-18 (10.7-11.7) 11172020	B55-PDI-SB-19 (11.6-12.6) 11172020	B55-PDI-SB-19 (12.6-13.6) 11172020	B55-PDI-SB-21 (4.5-5.5) 11172020	B55-PDI-SB-22 (5.2-6.2) 11182020
SVOCs - USEPA SW-846 Method 8270D (mg/kg) (cont'd)										
bis(2-Ethylhexyl)phthalate	117-81-7	- -	435	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
Butylbenzylphthalate	85-68-7	- -	122	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
Caprolactam	105-60-2	- -	- -	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 UJ
Carbazole	86-74-8	- -	- -	- -	0.045 U	0.045 U	0.045 U	0.046 U	0.042 U	0.045 U
Chrysene	218-01-9	1	- -	56	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Dibenzo(a,h)anthracene	53-70-3	1,000	- -	0.56	0.021 U	0.021 U	0.020 UJ	0.021 U	0.019 U	0.020 U
Dibenzofuran	132-64-9	210	6.2	350	0.045 U	0.045 U	0.045 U	0.046 U	0.042 U	0.045 U
Dicyclohexylamine	101-83-7	- -	- -	- -	13 EJ	1.8 J	7.5 EJ	13 EJ	2.3 UJ	24 D
Diethylphthalate	84-66-2	- -	7.1	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
Dimethylphthalate	131-11-3	- -	27	- -	0.21 U	0.21 U	0.20 UJ	0.21 U	0.19 U	0.20 U
Di-n-Butylphthalate	84-74-2	- -	8.1	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
Di-n-Octylphthalate	117-84-0	- -	120	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
Fluoranthene	206-44-0	1,000	- -	500	0.021 U	0.021 U	0.020 U	0.021 U	0.0046 J	0.0089 J
Fluorene	86-73-7	386	- -	500	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Hexachlorobenzene	118-74-1	3.2	1.4	6	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Hexachlorobutadiene	87-68-3	- -	- -	- -	0.095 U	0.094 U	0.093 U	0.097 U	0.088 U	0.094 U
Hexachlorocyclopentadiene	77-47-4	- -	- -	- -	0.62 U	0.62 U	R	0.63 U	0.57 U	R
Hexachloroethane	67-72-1	- -	- -	- -	0.21 U	0.21 U	0.20 UJ	0.21 U	0.19 U	0.20 UJ
Indeno(1,2,3-cd)pyrene	193-39-5	8.2	- -	5.6	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Isophorone	78-59-1	- -	4.4	- -	0.045 U	0.045 U	0.045 U	0.046 U	0.042 U	0.045 U
n,n-dimethylaniline	121-69-7	- -	- -	- -	0.20 UJ	0.20 U	0.21 UJ	0.21 UJ	0.19 UJ	0.20 U
Naphthalene	91-20-3	12	- -	500	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Nitrobenzene	98-95-3	- -	0.17	- -	0.083 U	0.082 U	0.081 U	0.084 U	0.076 U	0.081 U
N-Nitroso-di-n-propylamine	621-64-7	- -	- -	- -	0.062 U	0.062 U	0.061 U	0.063 U	0.057 U	0.061 U
N-Nitrosodiphenylamine	86-30-6	- -	- -	- -	0.045 U	0.045 U	0.045 U	0.046 U	0.042 U	0.045 U
o-Cresol (2-Methylphenol)	95-48-7	0.33	- -	500	0.083 U	0.082 U	0.081 U	0.084 U	0.076 U	0.081 U
Pentachlorophenol	87-86-5	0.8	- -	6.7	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
Phenanthrene	85-01-8	1,000	- -	500	0.021 U	0.021 U	0.020 U	0.021 U	0.019 U	0.020 U
Phenol	108-95-2	0.33	- -	500	0.045 U	0.045 U	0.045 U	0.046 U	0.042 U	0.045 U
Pyrene	129-00-0	1,000	- -	500	0.021 U	0.021 U	0.020 U	0.021 U	0.0074 J	0.011 J
Pyridine	110-86-1	- -	- -	- -	0.21 U	0.21 U	0.20 U	0.21 U	0.19 U	0.20 U
Triethylamine	121-44-8	- -	- -	- -	6.1 UJ	6.1 U	6.2 UJ	NA	5.8 UJ	6.1 UJ
Aldehydes - USEPA SW-846 Method 8315A (mg/kg)										
Acetaldehyde	75-07-0	- -	- -	- -	0.062 U	0.062 U	0.062 U	0.064 U	0.058 U	0.061 U
Formaldehyde	50-00-0	- -	- -	- -	0.083 J	0.069 J	0.092 J	0.16	0.18	0.11
Glutaraldehyde	111-30-8	- -	- -	- -	0.062 U	0.062 U	0.062 U	0.064 U	0.058 U	0.061 U

See Notes on Page 21.

Table 2B
Soil Analytical Results - TIC

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:		B55-PDI-SB-01		B55-PDI-SB-02	B55-PDI-SB-06	B55-PDI-SB-07	B55-PDI-SB-10	B55-PDI-SB-11	B55-PDI-SB-13	
Sample Depth (ft):		8 - 10	16 - 16.9	10 - 12	12 - 13	13 - 14	9 - 10	5 - 6	6 - 8	12 - 12.5
Date Collected:		11/09/20	11/09/20	11/10/20	11/11/20	11/11/20	11/12/20	11/12/20	11/13/20	11/13/20
Sample Name:	CAS Number	B55-PDI-SB-01 (8-10) 11102020	B55-PDI-SB-01 (16-16.9) 11102020	B55-PDI-SB-02 (10-12) 11102020	B55-PDI-SB-06 (12-13) 11172020	B55-PDI-07 (13-14) 11132020	B55-PDI-SB-10 (9-10) 11182020	B55-PDI-11 (5-6) 11132020	B55-PDI-13 (6-8) 11132020	B55-PDI-13 (12-12.5) 11132020
VOCs - TICs USEPA SW-486 Method 8260C (mg/kg)										
(1alpha,2beta,4alpha)-1,2,4-Trimethyl-Cyclopentane	16883-48-0									
1,2,3,4-Tetramethylbenzene	488-23-3					0.021 JN				0.088 JN
1,2,4,5-Tetramethylbenzene	95-93-2			1.9 JN				3.0 JN		
1,2,4-Trimethyl cyclohexane	2234-75-5									
1,2-Dimethyl-3-ethylbenzene	933-98-2					0.020 JN				0.11 JN
1,2-Dimethyl-4-ethylbenzene	934-80-5						21 JN			
1,3-Dimethyl-2-ethylbenzene	2870-04-4			2.5 JN				2.8 JN		
1,3-Dimethyl-4-ethylbenzene	874-41-9									
1-Decanol, 2-hexyl	2425-77-6									
1-Ethyl-2-methylbenzene	611-14-3	34 JN	0.0069 JN	2.0 JN		0.028 JN				
1H-INDENE,2,3-DIHYDRO-1,3-DIM	4175-53-5									
1-Methyl-3-ethylbenzene	620-14-4	77 JN		4.1 JN						
1-Methyl-4-(1-methylpropyl)-benzene	1595-16-0									
1-Tetradecene	1120-36-1									
2,3-Dimethylpentane	565-59-3						17 JN [17 JN]		12 JN	0.090 JN
2,4-diethyl-1-methyl-benzene	1758-85-6									
2,4-Dimethylhexane	589-43-5								6.3 JN	0.087 JN
2,4-Dimethylpentane	108-08-7								5.8 JN	
2,5-Dimethylhexane	592-13-2								10 JN	0.091 JN
2-Hexene, 3,5-dimethyl-	3404-79-3								3.9 JN	
2H-Quinolizin-2-ol, octahydro-, trans-	31172-60-8									
2-Methyl butane	78-78-4					0.031 JN				
2-Methylheptane	592-27-8	34 JN								
2-Methylhexane	591-76-4		0.0048 JN							
3-Methyl Pentane	96-14-0		0.0061 JN				24 JN [21 JN]			
3-Methylheptane	589-81-1	28 JN					31 JN [28 JN]			
3-Methylhexane	589-34-4	26 JN	0.0041 JN				28 JN [24 JN]			
3-Methylnonane	5911-04-6							2.4 JN		
3-Propyltoluene	1074-43-7			2.3 JN						
4-Ethyltoluene	622-96-8	36 JN		2.2 JN						
4-Methyldodecane	6117-97-1									
Benzene, (1-methyl-1-butenyl)-	53172-84-2									
Benzene, (2-methyl-1-propenyl)-	768-49-0					0.017 JN				
Benzene, 1-methyl-4-(2-propenyl)-	3333-13-9					0.013 JN				
Benzene, 2-ethenyl-1,4-dimethyl-	2039-89-6	31 JN		2.7 JN			18 JN [15 JN]			
Benzene, cyclopropyl-	873-49-4					0.033 JN				
Cyclopentane, 1,2,4-trimethyl-	2815-58-9								9.4 JN	0.11 JN

See Notes on Page 21.

Table 2B
Soil Analytical Results - TIC

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:		B55-PDI-SB-01		B55-PDI-SB-02	B55-PDI-SB-06	B55-PDI-SB-07	B55-PDI-SB-10	B55-PDI-SB-11	B55-PDI-SB-13	
Sample Depth (ft):		8 - 10	16 - 16.9	10 - 12	12 - 13	13 - 14	9 - 10	5 - 6	6 - 8	12 - 12.5
Date Collected:		11/09/20	11/09/20	11/10/20	11/11/20	11/11/20	11/12/20	11/12/20	11/13/20	11/13/20
Sample Name:	CAS Number	B55-PDI-SB-01 (8-10) 11102020	B55-PDI-SB-01 (16-16.9) 11102020	B55-PDI-SB-02 (10-12) 11102020	B55-PDI-SB-06 (12-13) 11172020	B55-PDI-07 (13-14) 11132020	B55-PDI-SB-10 (9-10) 11182020	B55-PDI-11 (5-6) 11132020	B55-PDI-13 (6-8) 11132020	B55-PDI-13 (12-12.5) 11132020
VOCs - TICs USEPA SW-486 Method 8260C (mg/kg) (cont'd)										
Cyclopentanone, 2-methyl-3-(1-methylethyl)-	54549-81-4									
Methylcyclopentane	96-37-7		0.0060 JN							
n-Octane	111-65-9	30 JN								
n-Propylbenzene	103-65-1					0.030 JN				
Pentane	109-66-0		0.0090 JN							
Trifluoroacetic acid, n-heptadecyl ester	1000216-79-2									
Unknown1	UNKVOA1	34 JN	0.0060 JN	3.9 JN		0.039 JN	27 JN [30 JN]	4.1 JN	6.6 JN	0.14 JN
Unknown2	UNKVOA2	31 JN		2.9 JN		0.012 JN	20 JN [20 JN]	3.9 JN	6.0 JN	0.11 JN
Unknown3	UNKVOA3			2.5 JN			16 JN [16 JN]	3.6 JN	5.0 JN	0.10 JN
Unknown4	UNKVOA4						16 JN [15 JN]	3.2 JN	4.4 JN	0.089 JN
Unknown5	UNKVOA5							2.9 JN		
Unknown6	UNKVOA6							2.7 JN		
Unknown7	UNKVOA7							2.4 JN		
Total VOC TICs	ARC-TVOCTICs	360 JN	0.043 JN	27 JN	0 JN	0.24 JN	220 JN [190 JN]	31 JN	69 JN	1.0 JN
SVOCs - TICs USEPA SW-846 Method 8270D (mg/kg)										
1,2,3,4-Tetramethylbenzene	488-23-3							0.36 JN		
1,2,3,5-Tetramethylbenzene	527-53-7	3.3 JN						0.52 JN		
1,2,3-Trimethylbenzene	526-73-8	4.8 JN								
1,2,4,5-Tetramethylbenzene	95-93-2	5.4 JN					13 JN [8.7 JN]			
1,2,4,5-Tetrathiane	291-22-5									
1,2,4-Trithiolane	289-16-7	7.5 JN		1.8 JN	0.45 JN					
1,2-Diethylbenzene	135-01-3			0.80 JN			11 JN [4.4 JN]			
1,2-Dimethyl-4-ethylbenzene	934-80-5						10 JN			
1,3,5-Trimethylbenzene	108-67-8	5.4 JN		0.59 JN						
1,3-diethyl-5-methyl-Benzene	2050-24-0						9.7 JN			
1,4-Diethylbenzene	105-05-5	8.2 JN								
1,4-Dimethyl-2-ethylbenzene	1758-88-9			0.40 JN				0.38 JN		
1-Ethyl-2-methylbenzene	611-14-3	3.5 JN								
1H-Indene, 2,3-dihydro-1,1,3-trime	2613-76-5						12 JN			
1H-Indene, 2,3-dihydro-1-methyl-	767-58-8	3.4 JN								
1-Methyl-2-propylbenzene	1074-17-5						13 JN			
1-Methyl-3-ethylbenzene	620-14-4	5.1 JN								
1-Methyl-4-(1-methylpropyl)-benzene	1595-16-0						12 JN [7.6 JN]	0.43 JN	1.1 JN	
1-Methylnaphthalene	90-12-0	3.5 JN								
1-PHENYL-1-BUTENE	824-90-8			0.53 JN			11 JN [15 JN]			
2,3-dihydro-4-methyl-1H-Indene	824-22-6	4.9 JN								
2,3-dihydro-5,6-dimethyl-1H-Indene	1075-22-5						18 JN [6 JN]			

See Notes on Page 21.

Table 2B
Soil Analytical Results - TIC

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:		B55-PDI-SB-01		B55-PDI-SB-02	B55-PDI-SB-06	B55-PDI-SB-07	B55-PDI-SB-10	B55-PDI-SB-11	B55-PDI-SB-13	
Sample Depth (ft):		8 - 10	16 - 16.9	10 - 12	12 - 13	13 - 14	9 - 10	5 - 6	6 - 8	12 - 12.5
Date Collected:		11/09/20	11/09/20	11/10/20	11/11/20	11/11/20	11/12/20	11/12/20	11/13/20	11/13/20
Sample Name:	CAS Number	B55-PDI-SB-01 (8-10) 11102020	B55-PDI-SB-01 (16-16.9) 11102020	B55-PDI-SB-02 (10-12) 11102020	B55-PDI-SB-06 (12-13) 11172020	B55-PDI-07 (13-14) 11132020	B55-PDI-SB-10 (9-10) 11182020	B55-PDI-11 (5-6) 11132020	B55-PDI-13 (6-8) 11132020	B55-PDI-13 (12-12.5) 11132020
SVOCs - TICs USEPA SW-846 Method 8270D (mg/kg) (cont'd)										
2,4-dimethyl styrene	2234-20-0	11 JN								
2,5-Dimethylfuran	625-86-5		R			0.18 JN				
2,6,11-Trimethyl-dodecane,	31295-56-4							0.41 JN		
2-Cyclohexen-1-one	930-68-7		0.20 JN	0.44 JN	0.37 JN	0.53 JN				
3-Methylnonane	5911-04-6								0.58 JN	
3-Propyltoluene	1074-43-7	4.3 JN								
4,6-Dimethyldodecane	61141-72-8						17 JN			
4,7-Dimethylindan	6682-71-9	3.1 JN						0.36 JN		
4-Ethyltoluene	622-96-8	9.4 JN								
Benzene, (1-methyl-1-butenyl)-	53172-84-2						11 JN			
Benzene, 1-(1-methylethenyl)-3-(1-	1129-29-9								0.50 JN	
Benzene, 1,3-diethyl-	141-93-5							0.33 JN		
Benzene, 2-ethenyl-1,4-dimethyl-	2039-89-6									
Benzene, diethylmethyl-	25550-13-4						20 JN			
Benzene, pentamethyl-	700-12-9								0.61 JN	
Cyclic octaatomic sulfur	10544-50-0					0.92 JN		1.3 JN	3.5 JN	0.40 JN
Cyclohexane, isothiocyanato-	1122-82-3				0.21 JN					
Cyclopentane, hexyl-	4457-00-5									
Ethanone, 1-(2,7-dimethylpyrazolo [1,5-a]pyridin-3-yl)-	17408-30-9			2.6 JN						
Ethyl 1,2,4-trimethylbenzene	54120-62-6						14 JN			
Lenthionine	292-46-6				2.1 JN					
m-Cymene / 1-Methyl-3-(1-methylethyl) benzene	535-77-3							0.52 JN		
Mesityl Oxide	141-79-7		0.17 JN							
N,N-Dicyclohexylmethylamine	7560-83-0			1.3 JN	4.1 JN	1.2 JN			0.43 JN	
Nonane, 3,7-dimethyl-	17302-32-8									
n-Propylbenzene	103-65-1									
N-Tetradecane	629-59-4									
N-Tridecane	629-50-5	3.5 JN								
Octamethylcyclotetrasiloxane	556-67-2									
p-Isopropyltoluene	99-87-6								0.62 JN	
Undecane, 3,6-dimethy1-	17301-28-9									
Unknown0	UNKSEMIVOA0					R		R	R	R
Unknown1	UNKSEMIVOA1	76 JN	21 JN	25 JN	4.2 JN	1.6 JN	36 JN [48 JN]	1.2 JN	8.0 JN	0.46 JN
Unknown2	UNKSEMIVOA2	50 JN	4.1 JN	16 JN	2.0 JN	1.2 JN	34 JN [17 JN]	1.1 JN	0.80 JN	0.44 JN
Unknown3	UNKSEMIVOA3	42 JN	0.99 JN	1.4 JN	1.7 JN	0.93 JN	20 JN [13 JN]	0.80 JN	0.73 JN	0.42 JN
Unknown4	UNKSEMIVOA4	18 JN	0.55 JN	0.93 JN	1.4 JN	0.86 JN	19 JN [12 JN]	0.78 JN	0.73 JN	0.33 JN

See Notes on Page 21.

Table 2B
Soil Analytical Results - TIC

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:		B55-PDI-SB-01		B55-PDI-SB-02	B55-PDI-SB-06	B55-PDI-SB-07	B55-PDI-SB-10	B55-PDI-SB-11	B55-PDI-SB-13	
Sample Depth (ft):		8 - 10	16 - 16.9	10 - 12	12 - 13	13 - 14	9 - 10	5 - 6	6 - 8	12 - 12.5
Date Collected:		11/09/20	11/09/20	11/10/20	11/11/20	11/11/20	11/12/20	11/12/20	11/13/20	11/13/20
Sample Name:	CAS Number	B55-PDI-SB-01 (8-10) 11102020	B55-PDI-SB-01 (16-16.9) 11102020	B55-PDI-SB-02 (10-12) 11102020	B55-PDI-SB-06 (12-13) 11172020	B55-PDI-07 (13-14) 11132020	B55-PDI-SB-10 (9-10) 11182020	B55-PDI-11 (5-6) 11132020	B55-PDI-13 (6-8) 11132020	B55-PDI-13 (12-12.5) 11132020
SVOCs - TICs USEPA SW-846 Method 8270D (mg/kg) (cont'd)										
Unknown5	UNKSEMIVOA5	12 JN	0.41 JN	0.74 JN	1.2 JN	0.76 JN	19 JN [8.4 JN]	0.75 JN	0.64 JN	0.23 JN
Unknown6	UNKSEMIVOA6	6.3 JN	0.32 JN	0.70 JN	1.2 JN	0.51 JN	17 JN [6.6 JN]	0.51 JN	0.64 JN	0.22 JN
Unknown7	UNKSEMIVOA7	3.7 JN	0.28 JN	0.68 JN	0.76 JN	0.43 JN	15 JN [6 JN]	0.48 JN	0.56 JN	0.21 JN
Unknown8	UNKSEMIVOA8	3.3 JN	0.19 JN	0.64 JN	0.59 JN	0.40 JN	13 JN [5.1 JN]	0.45 JN	0.54 JN	0.18 JN
Unknown9	UNKSEMIVOA9	2.9 JN	0.17 JN	0.64 JN	0.53 JN	0.36 JN	13 JN [4.8 JN]	0.40 JN	0.51 JN	0.17 JN
Unknown10	UNKSEMIVOA10			0.61 JN	0.51 JN	0.30 JN	11 JN [4.7 JN]	0.37 JN	0.49 JN	
Unknown11	UNKSEMIVOA11			0.61 JN	0.47 JN	0.23 JN	11 JN [4.4 JN]	0.36 JN	0.40 JN	
Unknown12	UNKSEMIVOA12			0.60 JN	0.47 JN		9.6 JN [3.7 JN]	0.36 JN	0.38 JN	
Unknown13	UNKSEMIVOA13			0.56 JN	0.45 JN			0.34 JN	0.36 JN	
Unknown14	UNKSEMIVOA14			0.52 JN	0.40 JN			0.33 JN	0.36 JN	
Unknown15	UNKSEMIVOA15			0.50 JN	0.40 JN				0.34 JN	
Unknown16	UNKSEMIVOA16			0.43 JN	0.34 JN				0.34 JN	
Unknown17	UNKSEMIVOA17			0.42 JN	0.27 JN					
Unknown18	UNKSEMIVOA18				0.24 JN					
Unknown19	UNKSEMIVOA19				0.19 JN					
Unknown20	UNKSEMIVOA20				0.18 JN					
Total SVOC TICs	ARC-TVOCTICs	300 JN	28 JN	59 JN	25 JN	10 JN	390 JN [180 JN]	13 JN	23 JN	3.1 JN

See Notes on Page 21.

Table 2B
Soil Analytical Results - TIC

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:		B55-PDI-SB-15	B55-PDI-SB-17		B55-PDI-SB-18		B55-PDI-SB-19		B55-PDI-SB-21	B55-PDI-SB-22
Sample Depth (ft):		8 - 9	8 - 9	9 - 10	9.5 - 10.5	10.7 - 11.7	11.6 - 12.6	12.6 - 13.6	4.5 - 5.5	5.2 - 6.2
Date Collected:		11/13/20	11/16/20	11/16/20	11/16/20	11/16/20	11/16/20	11/16/20	11/17/20	11/17/20
Sample Name:		B55-PDI-SB-15	B55-PDI-SB-17	B55-PDI-SB-17	B55-PDI-SB-18	B55-PDI-SB-18	B55-PDI-SB-19	B55-PDI-SB-19	B55-PDI-SB-21	B55-PDI-SB-22
	CAS Number	(8-9) 11132020	(8-9) 11172020	(9-10) 11172020	(9.5-10.5) 11172020	(10.7-11.7) 11172020	(11.6-12.6) 11172020	(12.6-13.6) 11172020	(4.5-5.5) 11172020	(5.2-6.2) 11182020
VOCs - TICs USEPA SW-486 Method 8260C (mg/kg)										
(1alpha,2beta,4alpha)-1,2,4-Trimethyl-Cyclopentane	16883-48-0		1.6 JN							
1,2,3,4-Tetramethylbenzene	488-23-3									
1,2,4,5-Tetramethylbenzene	95-93-2				0.79 JN		0.0062 JN			
1,2,4-Trimethyl cyclohexane	2234-75-5	0.098 JN		0.012 JN						
1,2-Dimethyl-3-ethylbenzene	933-98-2									
1,2-Dimethyl-4-ethylbenzene	934-80-5									
1,3-Dimethyl-2-ethylbenzene	2870-04-4									
1,3-Dimethyl-4-ethylbenzene	874-41-9				0.80 JN					
1-Decanol, 2-hexyl	2425-77-6									0.011 JN
1-Ethyl-2-methylbenzene	611-14-3									
1H-INDENE,2,3-DIHYDRO-1,3-DIM	4175-53-5				0.59 JN					
1-Methyl-3-ethylbenzene	620-14-4									
1-Methyl-4-(1-methylpropyl)-benzene	1595-16-0		2.3 JN							
1-Tetradecene	1120-36-1									0.0093 JN
2,3-Dimethylpentane	565-59-3									
2,4-diethyl-1-methyl-benzene	1758-85-6			0.014 JN						
2,4-Dimethylhexane	589-43-5	0.074 JN								
2,4-Dimethylpentane	108-08-7									
2,5-Dimethylhexane	592-13-2	0.17 JN	2.6 JN							
2-Hexene, 3,5-dimethyl-	3404-79-3									
2H-Quinolizin-2-ol, octahydro-, trans-	31172-60-8		1.5 JN							
2-Methyl butane	78-78-4									
2-Methylheptane	592-27-8									
2-Methylhexane	591-76-4									
3-Methyl Pentane	96-14-0									
3-Methylheptane	589-81-1				0.43 JN					
3-Methylhexane	589-34-4				0.48 JN					
3-Methylnonane	5911-04-6			0.014 JN						
3-Propyltoluene	1074-43-7									
4-Ethyltoluene	622-96-8									
4-Methyldodecane	6117-97-1									0.012 JN
Benzene, (1-methyl-1-butenyl)-	53172-84-2				0.57 JN					
Benzene, (2-methyl-1-propenyl)-	768-49-0									
Benzene, 1-methyl-4-(2-propenyl)-	3333-13-9									
Benzene, 2-ethenyl-1,4-dimethyl-	2039-89-6									
Benzene, cyclopropyl-	873-49-4									
Cyclopentane, 1,2,4-trimethyl-	2815-58-9	0.11 JN		0.013 JN						

See Notes on Page 21.

Table 2B
Soil Analytical Results - TIC

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:		B55-PDI-SB-15	B55-PDI-SB-17		B55-PDI-SB-18		B55-PDI-SB-19		B55-PDI-SB-21	B55-PDI-SB-22
Sample Depth (ft):		8 - 9	8 - 9	9 - 10	9.5 - 10.5	10.7 - 11.7	11.6 - 12.6	12.6 - 13.6	4.5 - 5.5	5.2 - 6.2
Date Collected:		11/13/20	11/16/20	11/16/20	11/16/20	11/16/20	11/16/20	11/16/20	11/17/20	11/17/20
Sample Name:		B55-PDI-SB-15	B55-PDI-SB-17	B55-PDI-SB-17	B55-PDI-SB-18	B55-PDI-SB-18	B55-PDI-SB-19	B55-PDI-SB-19	B55-PDI-SB-21	B55-PDI-SB-22
	CAS Number	(8-9) 11132020	(8-9) 11172020	(9-10) 11172020	(9.5-10.5) 11172020	(10.7-11.7) 11172020	(11.6-12.6) 11172020	(12.6-13.6) 11172020	(4.5-5.5) 11172020	(5.2-6.2) 11182020
VOCs - TICs USEPA SW-486 Method 8260C (mg/kg) (cont'd)										
Cyclopentanone, 2-methyl-3-(1-methylethyl)-	54549-81-4	0.15 JN								
Methylcyclopentane	96-37-7									
n-Octane	111-65-9									
n-Propylbenzene	103-65-1									
Pentane	109-66-0									
Trifluoroacetic acid, n-heptadecyl ester	1000216-79-2									0.015 JN
Unknown1	UNKVOA1	0.18 JN	2.6 JN	0.016 JN	0.61 JN		0.0063 JN			0.013 JN
Unknown2	UNKVOA2	0.14 JN	2.2 JN	0.014 JN	0.42 JN					0.010 JN
Unknown3	UNKVOA3	0.12 JN	1.9 JN	0.013 JN	0.41 JN					0.0097 JN
Unknown4	UNKVOA4	0.11 JN	1.7 JN	0.013 JN	0.38 JN					0.0094 JN
Unknown5	UNKVOA5	0.10 JN	1.6 JN	0.012 JN						0.0087 JN
Unknown6	UNKVOA6		1.6 JN	0.012 JN						0.0084 JN
Unknown7	UNKVOA7									
Total VOC TICs	ARC-TVOCTICs	1.3 JN	20 JN	0.13 JN	5.5 JN	0 JN	0.013 JN	0 JN	0 JN	0.11 JN
SVOCs - TICs USEPA SW-846 Method 8270D (mg/kg)										
1,2,3,4-Tetramethylbenzene	488-23-3									
1,2,3,5-Tetramethylbenzene	527-53-7									
1,2,3-Trimethylbenzene	526-73-8									
1,2,4,5-Tetramethylbenzene	95-93-2									
1,2,4,5-Tetrathiane	291-22-5			0.21 JN					0.57 JN	
1,2,4-Trithiolane	289-16-7			0.21 JN	0.40 JN		1.2 JN	1.4 JN	0.59 JN	
1,2-Diethylbenzene	135-01-3									
1,2-Dimethyl-4-ethylbenzene	934-80-5									
1,3,5-Trimethylbenzene	108-67-8									
1,3-diethyl-5-methyl-Benzene	2050-24-0									
1,4-Diethylbenzene	105-05-5									
1,4-Dimethyl-2-ethylbenzene	1758-88-9									
1-Ethyl-2-methylbenzene	611-14-3									
1H-Indene, 2,3-dihydro-1,1,3-trime	2613-76-5									
1H-Indene, 2,3-dihydro-1-methyl-	767-58-8									
1-Methyl-2-propylbenzene	1074-17-5									
1-Methyl-3-ethylbenzene	620-14-4									
1-Methyl-4-(1-methylpropyl)-benzene	1595-16-0									
1-Methylnaphthalene	90-12-0									
1-PHENYL-1-BUTENE	824-90-8									
2,3-dihydro-4-methyl-1H-Indene	824-22-6									
2,3-dihydro-5,6-dimethyl-1H-Indene	1075-22-5									

See Notes on Page 21.

Table 2B
Soil Analytical Results - TIC

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:		B55-PDI-SB-15	B55-PDI-SB-17		B55-PDI-SB-18		B55-PDI-SB-19		B55-PDI-SB-21	B55-PDI-SB-22
Sample Depth (ft):		8 - 9	8 - 9	9 - 10	9.5 - 10.5	10.7 - 11.7	11.6 - 12.6	12.6 - 13.6	4.5 - 5.5	5.2 - 6.2
Date Collected:		11/13/20	11/16/20	11/16/20	11/16/20	11/16/20	11/16/20	11/16/20	11/17/20	11/17/20
Sample Name:		B55-PDI-SB-15	B55-PDI-SB-17	B55-PDI-SB-17	B55-PDI-SB-18	B55-PDI-SB-18	B55-PDI-SB-19	B55-PDI-SB-19	B55-PDI-SB-21	B55-PDI-SB-22
	CAS Number	(8-9) 11132020	(8-9) 11172020	(9-10) 11172020	(9.5-10.5) 11172020	(10.7-11.7) 11172020	(11.6-12.6) 11172020	(12.6-13.6) 11172020	(4.5-5.5) 11172020	(5.2-6.2) 11182020
SVOCs - TICs USEPA SW-846 Method 8270D (mg/kg) (cont'd)										
2,4-dimethyl styrene	2234-20-0									
2,5-Dimethylfuran	625-86-5									R
2,6,11-Trimethyl-dodecane,	31295-56-4									
2-Cyclohexen-1-one	930-68-7				0.22 JN					0.58 JN
3-Methylnonane	5911-04-6									
3-Propyltoluene	1074-43-7									
4,6-Dimethyldodecane	61141-72-8									
4,7-Dimethylindan	6682-71-9									
4-Ethyltoluene	622-96-8									
Benzene, (1-methyl-1-butenyl)-	53172-84-2									
Benzene, 1-(1-methylethenyl)-3-(1-	1129-29-9									
Benzene, 1,3-diethyl-	141-93-5									
Benzene, 2-ethenyl-1,4-dimethyl-	2039-89-6									
Benzene, diethylmethyl-	25550-13-4									
Benzene, pentamethyl-	700-12-9		0.42 JN							
Cyclic octaatomic sulfur	10544-50-0	0.27 JN	0.44 JN		0.34 JN					0.78 JN
Cyclohexane, isothiocyanato-	1122-82-3				0.24 JN					0.31 JN
Cyclopentane, hexyl-	4457-00-5		0.34 JN							
Ethanone, 1-(2,7-dimethylpyrazolo [1,5-a]pyridin-3-yl)-	17408-30-9									
Ethyl 1,2,4-trimethylbenzene	54120-62-6									
Lenthionine	292-46-6			0.41 JN	0.69 JN		0.71 JN	0.26 JN	1.8 JN	
m-Cymene / 1-Methyl-3-(1-methylethyl) benzene	535-77-3									
Mesityl Oxide	141-79-7									
N,N-Dicyclohexylmethylamine	7560-83-0	0.52 JN	0.71 JN	0.28 JN	0.60 JN		0.47 JN	0.54 JN		0.36 JN
Nonane, 3,7-dimethyl-	17302-32-8									
n-Propylbenzene	103-65-1									
N-Tetradecane	629-59-4		0.35 JN							
N-Tridecane	629-50-5									
Octamethylcyclotetrasiloxane	556-67-2								0.15 JN	
p-Isopropyltoluene	99-87-6									
Undecane, 3,6-dimethy1-	17301-28-9									
Unknown0	UNKSEMIVOA0		R							R
Unknown1	UNKSEMIVOA1	1.2 JN	1.1 JN	12 JN	5.0 JN	12 JN	10 JN	23 JN	5.6 JN	1.1 JN
Unknown2	UNKSEMIVOA2	0.72 JN	0.43 JN	0.98 JN	2.7 JN	0.99 JN	5.8 JN	22 JN	4.5 JN	0.42 JN
Unknown3	UNKSEMIVOA3	0.69 JN	0.42 JN	0.54 JN	2.0 JN	0.47 JN	2.2 JN	3.4 JN	1.1 JN	0.37 JN
Unknown4	UNKSEMIVOA4	0.56 JN	0.42 JN	0.46 JN	1.9 JN	0.45 JN	1.4 JN	1.4 JN	0.79 JN	0.31 JN

See Notes on Page 21.

Table 2B
Soil Analytical Results - TIC

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:		B55-PDI-SB-15	B55-PDI-SB-17		B55-PDI-SB-18		B55-PDI-SB-19		B55-PDI-SB-21	B55-PDI-SB-22
Sample Depth (ft):		8 - 9	8 - 9	9 - 10	9.5 - 10.5	10.7 - 11.7	11.6 - 12.6	12.6 - 13.6	4.5 - 5.5	5.2 - 6.2
Date Collected:		11/13/20	11/16/20	11/16/20	11/16/20	11/16/20	11/16/20	11/16/20	11/17/20	11/17/20
Sample Name:		B55-PDI-SB-15 (8-9)	B55-PDI-SB-17 (8-9)	B55-PDI-SB-17 (9-10)	B55-PDI-SB-18 (9.5-10.5)	B55-PDI-SB-18 (10.7-11.7)	B55-PDI-SB-19 (11.6-12.6)	B55-PDI-SB-19 (12.6-13.6)	B55-PDI-SB-21 (4.5-5.5)	B55-PDI-SB-22 (5.2-6.2)
	CAS Number	11132020	11172020	11172020	11172020	11172020	11172020	11172020	11172020	11182020
SVOCs - TICs USEPA SW-846 Method 8270D (mg/kg) (cont'd)										
Unknown5	UNKSEMIVOA5	0.33 JN	0.41 JN	0.24 JN	1.1 JN	0.37 JN	1.1 JN	0.66 JN	0.76 JN	0.28 JN
Unknown6	UNKSEMIVOA6	0.27 JN	0.41 JN	0.18 JN	1.0 JN	0.32 JN	0.75 JN	0.64 JN	0.66 JN	0.27 JN
Unknown7	UNKSEMIVOA7	0.25 JN	0.41 JN		0.81 JN	0.29 JN	0.44 JN	0.58 JN	0.43 JN	
Unknown8	UNKSEMIVOA8	0.20 JN	0.40 JN		0.76 JN	0.27 JN	0.44 JN	0.54 JN	0.38 JN	
Unknown9	UNKSEMIVOA9		0.39 JN		0.49 JN	0.19 JN	0.26 JN	0.27 JN	0.34 JN	
Unknown10	UNKSEMIVOA10		0.38 JN		0.43 JN		0.21 JN	0.26 JN	0.29 JN	
Unknown11	UNKSEMIVOA11		0.38 JN		0.38 JN		0.19 JN	0.24 JN	0.15 JN	
Unknown12	UNKSEMIVOA12		0.37 JN		0.31 JN		0.17 JN	0.23 JN		
Unknown13	UNKSEMIVOA13		0.35 JN		0.30 JN			0.19 JN		
Unknown14	UNKSEMIVOA14		0.34 JN		0.25 JN			0.17 JN		
Unknown15	UNKSEMIVOA15		0.34 JN		0.25 JN			0.17 JN		
Unknown16	UNKSEMIVOA16		0.33 JN		0.22 JN					
Unknown17	UNKSEMIVOA17		0.30 JN		0.22 JN					
Unknown18	UNKSEMIVOA18		0.30 JN		0.18 JN					
Unknown19	UNKSEMIVOA19		0.30 JN		0.17 JN					
Unknown20	UNKSEMIVOA20									
Total SVOC TICs	ARC-TVOCTICs	5 JN	10 JN	16 JN	21 JN	15 JN	25 JN	56 JN	18 JN	4.8 JN

See Notes on Page 21.

Table 2
Soil Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Notes:

1. Restricted use SCO for commercial use and protection of groundwater are from 6 NYCRR Part 375-6.8.
2. CP-51 soil cleanup guidance values are from supplemental SCO presented in Table 1 of the CP-51 soil cleanup guidance.
3. Samples were collected by Arcadis and analyzed by Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, Pennsylvania.
4. Date collected as recorded on the table doesn't match the dates provided in the laboratory report or sample names because the laboratory report and sample names reference the dates recorded on the COC, and the dates recorded on the COC are when samples were shipped to the laboratory for analyses. The sample collection dates recorded on the table are based on field notes and soil boring logs.
5. Analytes detected in sample are shown in black font and analytes that are not detected are shown in gray font.
6. Field duplicate sample results are presented in brackets, [ ].
7. Data have been validated.
8. Designations:
   a) Bold black font = Analyte detected above restricted - protection of groundwater SCO.
   b) Orange bold and italic font = Analyte detected above CP-51 protection of groundwater SCO.
   c) Gray shading = Analyte detected above restricted - commercial use SCO.
   d) Gray italic font = Sample MDL exceeds the applicable NYSDEC Protection of Groundwater SCO. Note that, for some analytes the MDL was at or less than the applicable SCO, while the quantitation limit was greater than the applicable SCO.

Acronyms and Abbreviations:

BMS = Bristol-Myers Squibb Company.
CAS = Chemical Abstracts Service.
COC = chain of custody.
MDL = method detection limit.
NA = not analyzed.
- - = 6 NYCRR SCO not available.
6 NYCRR = Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York.
ft = Feet.
NYSDEC = New York State Department of Environmental Conservation.
POC = principal organic contaminant.
SCO = Soil Cleanup Objectives.
SVOC = semivolatile organic compound.
TIC = tentatively identified compound.
USEPA = United States Environmental Protection Agency.
VOC = volatile organic compound.
mg/kg = milligrams per kilogram.

Qualifiers:

B = Analyte was detected in the blank and sample.
D = Compound quantitated using a secondary dilution.
E = The compound was quantitated above the calibration range.
J = Estimated value. Result is greater than the MDL but less than the quantitation limit.
N = Presumptive evidence of material.
R = Data was rejected as part of validation.
U = Analyte not detected at associated quantitation limit.

Table 3A
Groundwater Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID: / Date Collected: / Sample Name:	CAS Number	TOGS 1.1.1 Groundwater Standard/Guidance Value	B55-PDI-SB-03 11/18/20 B55-PDI-SB-03 11182020	B55-PDI-SB-04 11/18/20 B55-PDI-SB-04 11182020	B55-PDI-SB-05 11/18/20 B55-PDI-SB-05 11182020	B55-PDI-SB-07 11/18/20 B55-PDI-SB-07 11182020	B55-PDI-SB-15 11/18/20 B55-PDI-SB-15 11182020	B55-PDI-SB-16 11/18/20 B55-PDI-SB-16 11182020	B55-PDI-SB-18 11/18/20 B55-PDI-SB-18 11182020	B55-PDI-SB-21 11/17/20 B55-PDI-SB-21 11172020
Volatile Organics - USEPA SW-846 Method 8260C (µg/L)										
1,1,1-Trichloroethane	71-55-6	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	79-34-5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
1,1,2-Trichloroethane	79-00-5	1	1.0 U	**26**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	75-34-3	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	75-35-4	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,3-Trichlorobenzene	87-61-6	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2,4-Trichlorobenzene	120-82-1	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2,4-Trimethylbenzene	95-63-6	5	4.2 J	**1,200 D**	**7.4**	**13**	**10**	**6.3**	**7.1**	5.0 U
1,2-Dibromo-3-chloropropane	96-12-8	0.04	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dibromoethane	106-93-4	0.0006	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	95-50-1	3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethane	107-06-2	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	78-87-5	1	1.0 U	**4.0**	1.0 U	1.0 U	1.0 U	1.0 U	0.47 J	1.0 U
1,3,5-Trimethylbenzene	108-67-8	5	0.93 J	**300**	1.6 J	2.8 J	2.2 J	1.4 J	4.4 J	5.0 U
1,3-Dichlorobenzene	541-73-1	3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,4-Dichlorobenzene	106-46-7	3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,4-Dioxane	123-91-1	- -	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 UJ
2-Hexanone	591-78-6	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitropropane	79-46-9	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	67-64-1	50	20 U	16 J	20 UB	20 UB	20 UB	1.9 J	18 J	1.3 J
Acetonitrile	75-05-8	- -	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Benzene	71-43-2	1	1.0 U	0.93 J	1.0 U	1.0 U	1.0 U	1.0 U	0.51 J	1.0 U
Bromochloromethane	74-97-5	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromodichloromethane	75-27-4	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	75-25-2	50	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Bromomethane	74-83-9	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ
Carbon Disulfide	75-15-0	60	5.0 U	0.29 J	0.25 J	5.0 U	0.39 J	5.0 U	0.34 J	5.0 U
Carbon Tetrachloride	56-23-5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	108-90-7	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane	75-45-6	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	75-00-3	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	67-66-3	7	2.1	1.0 U	0.61 J	1.0 U	0.56 J	1.0 U	1.0 U	1.0 U
Chloromethane	74-87-3	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	156-59-2	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	10061-01-5	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	110-82-7	- -	1.6 J	330 D	2.9 J	4.6 J	5.0 U	1.6 J	13	5.0 UJ
Cyclohexanone	108-94-1	- -	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Dibromochloromethane	124-48-1	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	75-71-8	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethyl acetate	141-78-6	- -	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

See Notes on Page 7.

Table 3A
Groundwater Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID: / Date Collected: / Sample Name:	CAS Number	TOGS 1.1.1 Groundwater Standard/Guidance Value	B55-PDI-SB-03 11/18/20 B55-PDI-SB-03 11182020	B55-PDI-SB-04 11/18/20 B55-PDI-SB-04 11182020	B55-PDI-SB-05 11/18/20 B55-PDI-SB-05 11182020	B55-PDI-SB-07 11/18/20 B55-PDI-SB-07 11182020	B55-PDI-SB-15 11/18/20 B55-PDI-SB-15 11182020	B55-PDI-SB-16 11/18/20 B55-PDI-SB-16 11182020	B55-PDI-SB-18 11/18/20 B55-PDI-SB-18 11182020	B55-PDI-SB-21 11/17/20 B55-PDI-SB-21 11172020
Volatile Organics - USEPA SW-846 Method 8260C (µg/L) (cont'd)										
Ethyl ether	60-29-7	- -	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	100-41-4	5	1.2	**320 D**	2.5	3.1	2.5	1.5	**5.4**	1.0 U
Isobutanol	78-83-1	- -	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
Isopropylbenzene	98-82-8	5	0.23 J	**82**	0.48 J	0.64 J	0.55 J	0.29 J	2.2 J	5.0 U
m,p-Xylene	ARC-mpXyl	5	2.2 J	**580 D**	4.5 J	**6.0**	4.6 J	2.8 J	**7.8**	5.0 U
Methyl acetate	79-20-9	- -	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methyl ethyl ketone (MEK, 2-butanone)	78-93-3	50	10 U	10 U	10 U	10 U	10 U	10 U	11	10 U
Methyl isobutyl ketone (MIBK, 4-methyl-2-pentanone)	108-10-1	50	10 U	10 U	10 U	10 U	10 U	10 U	0.52 J	10 U
Methyl tert-butyl ether	1634-04-4	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylcyclohexane	108-87-2	- -	0.72 J	220	1.2 J	2.3 J	1.7 J	1.0 J	26	5.0 U
Methylene Chloride	75-09-2	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	91-20-3	10	5.0 U	**170**	1.7 J	1.6 J	1.3 J	5.0 U	2.6 J	5.0 U
n-Butanol	71-36-3	50	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
n-Butylbenzene	104-51-8	5	5.0 U	**30**	5.0 U	0.20 J	5.0 U	5.0 U	2.0 J	5.0 U
N-Heptane	142-82-5	- -	5.0 U	37	5.0 U	5.0 U	5.0 U	5.0 U	9.6	5.0 UJ
o-Xylene	95-47-6	5	0.73 J	**280**	1.7	2.0	1.6	0.93 J	3.4	1.0 U
p-Isopropyltoluene	99-87-6	5	5.0 U	**7.0**	5.0 U	5.0 U	5.0 U	5.0 U	0.58 J	5.0 U
sec-Butylbenzene	135-98-8	5	5.0 U	**12**	5.0 U	5.0 U	5.0 U	5.0 U	1.1 J	5.0 U
Styrene	100-42-5	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
tert-Butylbenzene	98-06-6	5	5.0 U	0.59 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Tertiary butyl alcohol	75-65-0	- -	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Tetrachloroethene	127-18-4	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ
Tetrahydrofuran	109-99-9	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	108-88-3	5	1.0 U	**9.9**	0.23 J	1.0 U	0.21 J	1.0 U	0.51 J	1.0 U
trans-1,2-Dichloroethene	156-60-5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	10061-02-6	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	79-01-6	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	75-69-4	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ
Vinyl Chloride	75-01-4	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	1330-20-7	5	2.9 J	**800 D**	**6.2**	**8.0**	**6.2**	3.7 J	**11**	6.0 U
Semivolatile Organics - USEPA SW-846 Method 8270D (µg/L)										
1,1'-Biphenyl	92-52-4	5	10 U	13 U	13 U	11 U	12 U	110 U	10 U	10 U
1,2,4,5-Tetrachlorobenzene	95-94-3	5	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
1,4-Dioxane	123-91-1	- -	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
2,2-Oxybis(1-Chloropropane)	108-60-1	5	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
2,3,4,6-Tetrachlorophenol	58-90-2	1	10 U	13 U	13 U	11 U	12 U	110 U	10 U	10 U
2,4,5-Trichlorophenol	95-95-4	1	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
2,4,6-Trichlorophenol	88-06-2	1	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
2,4-Dichlorophenol	120-83-2	1	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
2,4-Dimethylphenol	105-67-9	1	10 U	13 U	13 U	11 U	12 U	110 U	10 U	10 U

See Notes on Page 7.

Table 3A
Groundwater Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID: / Date Collected: / Sample Name:	CAS Number	TOGS 1.1.1 Groundwater Standard/Guidance Value	B55-PDI-SB-03 11/18/20 B55-PDI-SB-03 11182020	B55-PDI-SB-04 11/18/20 B55-PDI-SB-04 11182020	B55-PDI-SB-05 11/18/20 B55-PDI-SB-05 11182020	B55-PDI-SB-07 11/18/20 B55-PDI-SB-07 11182020	B55-PDI-SB-15 11/18/20 B55-PDI-SB-15 11182020	B55-PDI-SB-16 11/18/20 B55-PDI-SB-16 11182020	B55-PDI-SB-18 11/18/20 B55-PDI-SB-18 11182020	B55-PDI-SB-21 11/17/20 B55-PDI-SB-21 11172020
Semivolatile Organics - USEPA SW-846 Method 8270D (µg/L) (cont'd)										
2,4-Dinitrophenol	51-28-5	1	31 U	38 U	38 U	32 U	36 U	320 U	31 U	30 U
2,4-Dinitrotoluene	121-14-2	5	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
2,6-Dinitrotoluene	606-20-2	5	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
2-Chloronaphthalene	91-58-7	10	1.0 U	1.3 U	1.3 U	1.1 U	1.2 U	11 U	1.0 U	1.0 U
2-Chlorophenol	95-57-8	1	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
2-Methylnaphthalene	91-57-6	- -	0.52 U	46	0.63 U	0.54 U	0.60 U	5.3 U	0.52 U	0.51 U
2-Nitroaniline	88-74-4	5	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
2-Nitrophenol	88-75-5	1	10 U	13 U	13 U	11 U	12 U	110 U	10 U	10 U
3&4-Methylphenol	65794-96-9	1	2.1 U	**3.5**	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
3,3'-Dichlorobenzidine	91-94-1	5	10 U	13 U	13 U	11 U	12 U	110 U	10 U	10 U
3-Nitroaniline	99-09-2	5	7.3 U	8.9 U	8.8 U	7.5 U	8.5 U	74 U	7.2 U	7.1 U
4,6-Dinitro-2-methylphenol	534-52-1	1	22 U	27 U	26 U	23 U	25 U	220 U	22 U	21 U
4-Bromophenyl-phenylether	101-55-3	- -	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
4-Chloro-3-Methylphenol	59-50-7	1	3.6 U	4.5 U	4.4 U	3.8 U	4.2 U	37 U	3.6 U	3.5 U
4-Chloroaniline	106-47-8	5	10 U	13 U	13 U	11 U	12 U	110 U	10 U	10 U
4-Chlorophenyl-phenylether	7005-72-3	- -	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
4-Nitroaniline	100-01-6	5	3.1 U	3.8 U	3.8 U	3.2 U	3.6 U	32 U	3.1 U	3.0 U
4-Nitrophenol	100-02-7	1	31 U	38 U	38 U	32 U	36 U	320 U	31 U	30 U
Acenaphthene	83-32-9	20	0.52 U	1.4	0.63 U	0.54 U	0.60 U	5.3 U	0.52 U	0.17 J
Acenaphthylene	208-96-8	- -	0.52 U	0.64 U	0.63 U	0.54 U	0.60 U	5.3 U	0.52 U	0.42 J
Acetophenone	98-86-2	- -	10 U	13 U	13 U	11 U	12 U	110 U	10 U	10 U
Aniline	62-53-3	5	10 U	13 U	13 U	11 U	12 U	110 U	10 U	10 U
Anthracene	120-12-7	50	0.52 U	0.66	0.63 U	0.54 U	0.60 U	1.7 J	0.23 J	0.16 J
Atrazine	1912-24-9	7.5	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
Benzaldehyde	100-52-7	- -	10 U	13 U	13 U	11 U	12 U	110 U	10 U	10 U
Benzo(a)anthracene	56-55-3	0.002	0.52 U	**0.41 J**	0.63 U	0.54 U	0.60 U	**7.6**	**0.20 J**	**0.98**
Benzo(a)pyrene	50-32-8	0	0.52 U	**0.37 J**	0.63 U	0.54 U	0.60 U	**9.2**	**0.21 J**	**1.5**
Benzo(b)fluoranthene	205-99-2	0.002	0.52 U	**0.41 J**	0.63 U	0.54 U	0.60 U	**10**	**0.20 J**	**1.2**
Benzo(g,h,i)perylene	191-24-2	- -	0.52 U	0.21 J	0.63 U	0.54 U	0.60 U	5.0 J	0.52 U	0.91
Benzo(k)fluoranthene	207-08-9	0.002	0.52 U	**0.20 J**	0.63 U	0.54 U	0.60 U	**4.6 J**	**0.13 J**	**0.53**
Benzyl Alcohol	100-51-6	- -	31 U	38 U	38 U	32 U	36 U	320 U	31 U	30 U
bis(2-Chloroethoxy)methane	111-91-1	5	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
bis(2-Chloroethyl)ether	111-44-4	1	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
bis(2-Ethylhexyl)phthalate	117-81-7	5	11 U	14 U	14 U	12 U	13 U	**56 J**	11 U	11 U
Butylbenzylphthalate	85-68-7	50	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
Caprolactam	105-60-2	- -	11 U	14 U	14 U	12 U	13 U	120 U	11 U	11 U
Carbazole	86-74-8	- -	2.1 U	2.1 J	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
Chrysene	218-01-9	0.002	0.52 U	**0.42 J**	0.63 U	0.54 U	0.60 U	**8.9**	**0.27 J**	**1.3**
Dibenzo(a,h)anthracene	53-70-3	- -	0.52 U	0.64 U	0.63 U	0.54 U	0.60 U	5.3 U	0.52 U	0.51 U
Dibenzofuran	132-64-9	- -	2.1 U	1.1 J	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
Dicyclohexylamine	101-83-7	50	21 UJ	**1,100 DJ**	25 UJ	22 UJ	24 UJ	210 UJ	21 UJ	**220 DJ**

See Notes on Page 7.

Table 3A
Groundwater Analytical Results

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID: / Date Collected: / Sample Name:	CAS Number	TOGS 1.1.1 Groundwater Standard/Guidance Value	B55-PDI-SB-03 11/18/20 B55-PDI-SB-03 11182020	B55-PDI-SB-04 11/18/20 B55-PDI-SB-04 11182020	B55-PDI-SB-05 11/18/20 B55-PDI-SB-05 11182020	B55-PDI-SB-07 11/18/20 B55-PDI-SB-07 11182020	B55-PDI-SB-15 11/18/20 B55-PDI-SB-15 11182020	B55-PDI-SB-16 11/18/20 B55-PDI-SB-16 11182020	B55-PDI-SB-18 11/18/20 B55-PDI-SB-18 11182020	B55-PDI-SB-21 11/17/20 B55-PDI-SB-21 11172020
Semivolatile Organics - USEPA SW-846 Method 8270D (µg/L) (cont'd)										
Diethylphthalate	84-66-2	50	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
Dimethylphthalate	131-11-3	50	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
Di-n-Butylphthalate	84-74-2	50	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
Di-n-Octylphthalate	117-84-0	50	11 U	14 U	14 U	12 U	13 U	120 U	11 U	11 U
Fluoranthene	206-44-0	50	0.52 U	1.3	0.63 U	0.54 U	0.17 J	13	0.53	1.5
Fluorene	86-73-7	50	0.52 U	1.5	0.63 U	0.54 U	0.60 U	5.3 U	0.52 U	0.18 J
Hexachlorobenzene	118-74-1	0.04	0.52 U	**0.46 J**	0.63 U	0.54 U	0.60 U	5.3 U	0.52 U	0.51 U
Hexachlorobutadiene	87-68-3	0.5	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
Hexachlorocyclopentadiene	77-47-4	5	11 U	14 U	14 U	12 U	13 U	120 U	11 U	11 U
Hexachloroethane	67-72-1	5	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
Indeno(1,2,3-cd)pyrene	193-39-5	0.002	0.52 U	**0.23 J**	0.63 U	0.54 U	0.60 U	**5.0 J**	0.52 U	**0.73**
Isophorone	78-59-1	50	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
n,n-dimethylaniline	121-69-7	1	1.0 U	1.3 U	1.3 U	1.1 U	1.2 U	11 U	1.0 U	1.0 U
Naphthalene	91-20-3	10	0.23 J	**51**	0.63 U	0.54 U	0.60 U	1.4 J	0.52 U	0.51 U
Nitrobenzene	98-95-3	0.4	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
N-Nitroso-di-n-propylamine	621-64-7	- -	3.1 U	3.8 U	3.8 U	3.2 U	3.6 U	32 U	3.1 U	3.0 U
N-Nitrosodiphenylamine	86-30-6	50	3.1 U	3.8 U	3.8 U	3.2 U	3.6 U	32 U	3.1 U	3.0 U
o-Cresol (2-Methylphenol)	95-48-7	1	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
Pentachlorophenol	87-86-5	1	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
Phenanthrene	85-01-8	50	0.52 U	2.7	0.63 U	0.54 U	0.60 U	7.1	0.24 J	0.59
Phenol	108-95-2	1	2.1 U	2.5 U	2.5 U	2.2 U	2.4 U	21 U	2.1 U	2.0 U
Pyrene	129-00-0	50	0.52 U	1.0	0.63 U	0.54 U	0.16 J	15	0.46 J	2.5
Pyridine	110-86-1	50	5.2 U	6.4 U	6.3 U	5.4 U	6.0 U	53 U	5.2 U	5.1 U
Triethylamine	121-44-8	50	10 U	13 U	13 U	11 U	12 U	110 U	10 U	R
Aldehydes - USEPA SW-846 Method 8315A (µg/L)										
Acetaldehyde	75-07-0	8	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U
Formaldehyde	50-00-0	8	50 U	**30 J**	50 U	50 U	50 U	50 U	50 U	50 U
Glutaraldehyde	111-30-8	- -	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U

See Notes on Page 7.

Table 3B
Groundwater Analytical Results - TIC

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:		B55-PDI-SB-03	B55-PDI-SB-04	B55-PDI-SB-05	B55-PDI-SB-07	B55-PDI-SB-15	B55-PDI-SB-16	B55-PDI-SB-18	B55-PDI-SB-21
Date Collected:		11/18/20	11/18/20	11/18/20	11/18/20	11/18/20	11/18/20	11/18/20	11/17/20
Sample Name:	CAS Number	B55-PDI-SB-03 11182020	B55-PDI-SB-04 11182020	B55-PDI-SB-05 11182020	B55-PDI-SB-07 11182020	B55-PDI-SB-15 11182020	B55-PDI-SB-16 11182020	B55-PDI-SB-18 11182020	B55-PDI-SB-21 11172020
Volatile Organics - TIC USEPA SW-846 Method 8260C (µg/L)									
1,2,3,4-Tetramethylbenzene	488-23-3							12 JN	
1,2,3-Trimethylbenzene	526-73-8		350 JN						
1,2-Dimethyl-3-ethylbenzene	933-98-2		180 JN						
1,3-Dimethyl-4-ethylbenzene	874-41-9							19 JN	
1,3-Dimethylcyclopentane (cis)	2532-58-3							9.7 JN	
1-Ethyl-2-methylbenzene	611-14-3		460 JN					11 JN	
1H-Indene, 2,3-dihydro-1-methyl-	767-58-8							14 JN	
1H-Indene, 2,3-dihydro-5-methyl-	874-35-1							14 JN	
1-Methyl-3-ethylbenzene	620-14-4		360 JN		5.8 JN				
2-Methyl butane	78-78-4		420 JN						
2-Methylhexane	591-76-4							12 JN	
3-Methyl Pentane	96-14-0							29 JN	
3-Methylhexane	589-34-4							13 JN	
3-Phenylbut-1-ene	934-10-1		300 JN						
Benzene, 2-ethenyl-1,4-dimethyl-	2039-89-6							23 JN	
Benzene, cyclopropyl-	873-49-4		310 JN						
Methylcyclopentane	96-37-7		370 JN						
n-Propylbenzene	103-65-1		190 JN						
Pentane	109-66-0		230 JN						
Unknown1	UNKVOA1			5.3 J	7.6 JN				
Total VOC TIC	ARC-TVOCTICs	0 JN	3,200 JN	5.3 J	13 JN	0 JN	0 JN	160 JN	0 JN
Semivolatile Organics - TIC USEPA SW-846 Method 8270D (µg/L)									
1,2,3,4-Tetramethylbenzene	488-23-3		150 JN						
1,2,3-Trimethylbenzene	526-73-8		310 JN						
1,2,4,5-Tetramethylbenzene	95-93-2		120 JN						
1,2-Dimethyl-4-ethylbenzene	934-80-5		250 JN						
1,3,5-Trimethylbenzene	108-67-8		810 JN						
1,4-Dimethyl-2-ethylbenzene	1758-88-9		100 JN						
1-Ethyl-2-methylbenzene	611-14-3		420 JN						
1H-Indene, 2,3-dihydro-1-methyl-	767-58-8		140 JN						
1H-Indene,2,3-dihydro-2,2-dimethyl-	20836-11-7		59 JN						
1-Methyl-3-ethylbenzene	620-14-4		330 JN						
2-Ethyl-1-Hexanol	104-76-7					6.1 JN			
2-Fluoro-6-nitrophenol	1526-17-6			5.4 JN					
3-Propyltoluene	1074-43-7		110 JN						
4-Ethyltoluene	622-96-8		360 JN						
Benzene, (2-methyl-1-propenyl)-	768-49-0		300 JN						
Benzene, 1,3-diethyl-	141-93-5		77 JN						
Benzene, 2-ethenyl-1,4-dimethyl-	2039-89-6		170 JN						
Docosane	629-97-0							10 JN	
Ethylbenzene	100-41-4		150 JN						

See Notes on Page 7.

Table 3B
Groundwater Analytical Results - TIC

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Location ID:		B55-PDI-SB-03	B55-PDI-SB-04	B55-PDI-SB-05	B55-PDI-SB-07	B55-PDI-SB-15	B55-PDI-SB-16	B55-PDI-SB-18	B55-PDI-SB-21
Date Collected:		11/18/20	11/18/20	11/18/20	11/18/20	11/18/20	11/18/20	11/18/20	11/17/20
Sample Name:	CAS Number	B55-PDI-SB-03 11182020	B55-PDI-SB-04 11182020	B55-PDI-SB-05 11182020	B55-PDI-SB-07 11182020	B55-PDI-SB-15 11182020	B55-PDI-SB-16 11182020	B55-PDI-SB-18 11182020	B55-PDI-SB-21 11172020
Semivolatile Organics - TIC USEPA SW-846 Method 8270D (µg/L) (cont'd)									
Hexatriacontane	630-06-8							4.9 JN	
Indane	496-11-7		170 JN						
Isopropylbenzene	98-82-8		440 JN						
n-Propylbenzene	103-65-1		70 JN						
Octacosane	630-02-4							9.8 JN	
Octadecane	593-45-3							4.9 JN	
p-Isopropyltoluene	99-87-6		82 JN						
p-Xylene	106-42-3		200 JN						
Tetralin	119-64-2		63 JN						
Unknown1	UNKVOA1	5.0 JN	210 JN	9.3 JN	14 JN	14 JN			7.6 JN
Unknown2	UNKVOA2		69 JN	6.7 JN		6.1 JN			
Unknown3	UNKVOA3		66 JN	5.6 JN					
Total SVOC TIC	ARC-TSVOCTICs	5.0 JN	5,200 JN	27 JN	14 JN	26 JN	0 JN	30 JN	7.6 JN

See Notes on Page 7.

Notes:

1. Results compared to NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards and Guidance Values.
2. Samples were collected by Arcadis and analyzed by Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, Pennsylvania.
3. Analytes detected in sample are shown in black font and analytes that are not detected are shown in gray font.
4. Data have been validated.
5. Designations:
   a) Bold font with gray shading = Analyte detected at concentrations greater than NYSDEC TOGS 1.1.1. or a default screening value for purposes of this report.
   b) Italic font = Sample MDL exceeds NYSDEC TOGS 1.1.1 value. Note that, for some analytes the MDL was at or less than the TOGS 1.1.1 value, while the quantitation limit was greater than the TOGS 1.1.1 value.
   c) † = Not determined to be a POC at this time based on review of TOGS Part 1(B)(2) Steps 1 through 3.
   d) () = Value in parenthesis and gray font indicate a default screening value being used for purposes of this Report.

Acronyms and Abbreviations:

BMS = Bristol-Myers Squibb Company.
CAS = Chemical Abstracts Service.
MDL = method detection limit.
CAS = Chemical Abstracts Service.
ND = nondetect.
NYSDEC = New York State Department of Environmental Conservation.
POC = principal organic contaminant.
SVOC = semivolatile organic compound.
TIC = tentatively identified compound.
USEPA = United States Environmental Protection Agency.
VOC = volatile organic compound.
- - = Substance not regulated by the POC Groundwater Standard (TOGS 1.1.1, Table 3).
µg/L = micrograms per liter.

Qualifiers:

B = Analyte was detected in the blank and sample.
D = Compound quantitated using a secondary dilution.
J = Estimated value. Result is greater than the MDL but less than the quantitation limit.
N = Presumptive evidence of material.
R = Data was rejected as part of validation.
U = Analyte not detected at associated quantitation limit.

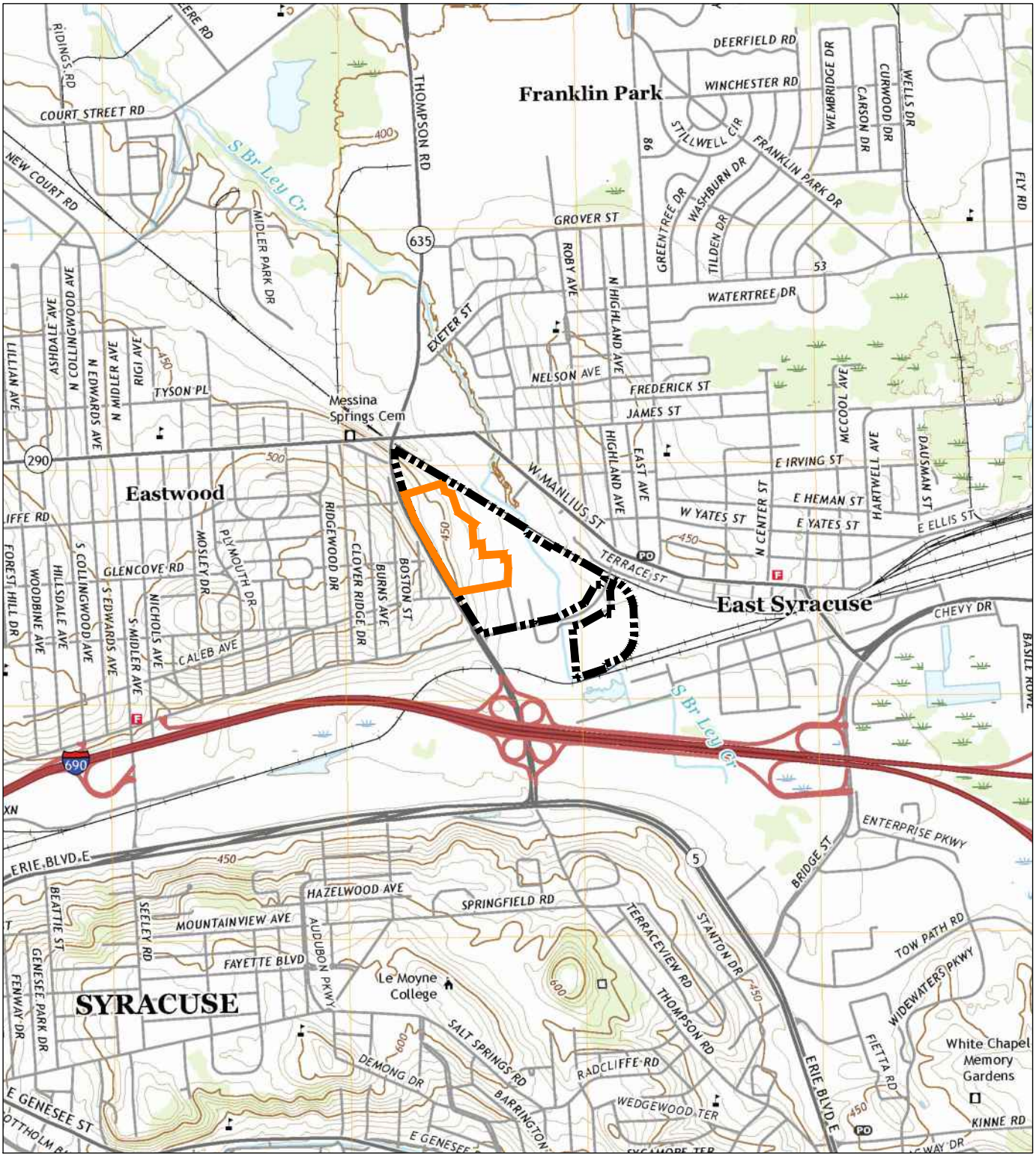
Table 4
Potential for TISR[SM] to Enhance COC Degradation Rates

Building 55 Area Interim Remedial Measure Work Plan
Site #C734138: BMS Syracuse North Campus Restoration Area

Parameter	Primary Degradation Pathway in the Subsurface	Relative Degradation Rate at Ambient Conditions	Comments
1,2,4-Trimethylbenzene	Biotic	Below Average	Tests show above average degradation at 20°C, Ft. Drum TISR[SM] system had above average degradation
1,3,5-Trimethylbenzene	Biotic	Below Average	Tests show above average degradation at 20°C, Ft. Drum TISR[SM] system had above average degradation
Ethylbenzene	Biotic	Average	Ft. Drum TISR[SM] system had above average degradation
Isopropylbenzene	Biotic	Average	Ft. Drum TISR[SM] system had minimal initial concentrations (100 ug/L) but went to <5.0 ug/L
Naphthalene	Biotic	Below Average	Ft. Drum TISR[SM] system had above average degradation
Xylenes	Biotic	Average	Ft. Drum TISR[SM] system had above average degradation
Acetone	Biotic	Above Average	
1,1,2-Trichloroethane	Biotic/Abiotic	Biotic Average, Abiotic Below Average	Not expected to have a viable abiotic pathway of degradation
1,2-Dichloropropane	Biotic/Abiotic	Below Average	Limited data available, current groundwater concentrations within an order of magnitude of standard
n-butylbenzene	Biotic	Average, 25°C Above Average	Ft. Drum TISR[SM] system had minimal initial concentrations (15 ug/L) but went to <5.0 ug/L
p-Isopropyltoluene	Biotic	Average	
sec-butylbenzene	Biotic	Average	Ft. Drum TISR[SM] system had minimal initial concentrations (10 ug/L) but went to <5.0 ug/L, above average rate noted at 25°C
Toluene	Biotic	Above Average	Ft. Drum TISR[SM] system had above average degradation
3&4 Methylphenol	Biotic	Below Average	Current groundwater concentrations within an order of magnitude of standard
Benzo(a)anthracene	Biotic	Below Average	
Benzo(a)pyrene	Biotic	Below Average	Tests show substantial increases in degradation rates with increases in temperature within the target range of the proposed remedy
Benzo(b)fluoranthene	Biotic	Below Average	Chemical structure is not favorable for degradation under ambient conditions, but limited data available
Benzo(k)fluoranthene	Biotic	Below Average	Chemical structure is not favorable for degradation under ambient conditions, but limited data available
Chrysene	Biotic	Below Average	Chemical structure is not favorable for degradation under ambient conditions, but limited data available
Dicyclohexylamine	Biotic	Average	Limited data available
Hexachlorobenzene	Biotic	Below Average	Current groundwater concentrations are approximately an order of magnitude above standard
Indeno (1,2,3-cd) pyrene	Biotic	Below Average	
Formaldehyde	Biotic	Above Average	
bis (2-ethylhexylphthalate)	Biotic	Average	

Notes:
1. Volatilization not included, but increased Henry's Law Constants will increase volatilization.
2. Rates are not considering other chemicals accompanying the specific compound and the potential effects that may have on degradation pathways and rates.
3. The relative degradation rate at ambient conditions reflect natural degradation rates. Degradation rates have been shown to increase with increasing temperature through enhanced biodegradation, better transfer of volatile compounds to the vapor phase where they may more readily degrade, as well as increase rates of abiotic degradation processes. While biotic degradation presume that there will be adequate DO throughout the TTZ, DO saturation concentrations decline with increasing temperature.

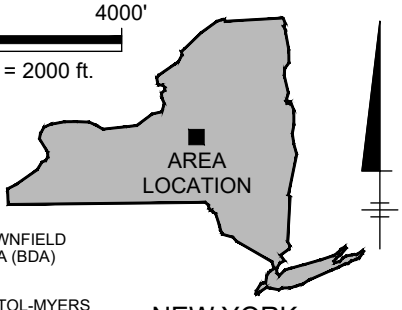
FIGURES



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., SYRACUSE EAST, NEW YORK, 2019.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



LEGEND:

- APPROXIMATE BROWNFIELD DEVELOPMENT AREA (BDA) BOUNDARY
- APPROXIMATE BRISTOL-MYERS SQUIBB PROPERTY LINE

IMAGES:
NY_Syracuse East.png
NY_Syracuse_East.jpg

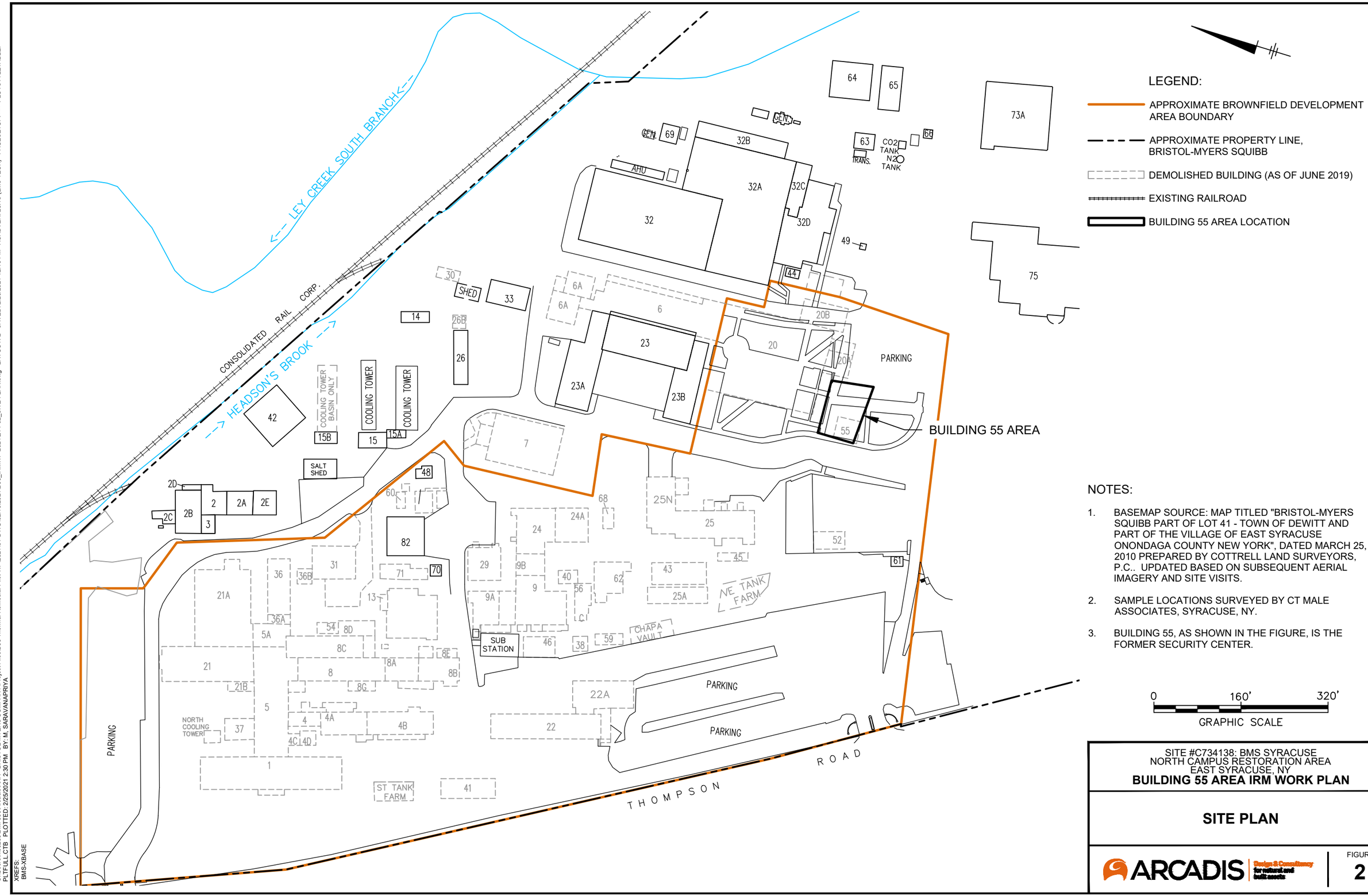
SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY
BUILDING 55 AREA IRM WORK PLAN

SITE VICINITY MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

C:\Users\ms0285\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\01-DWG\02.16.2021\B55_IRMWP_01_SLM.dwg LAYOUT: 1 SAVED: 2/23/2021 2:16 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/23/2021 6:25 PM BY: M. SARAVANAPRIYA



LEGEND:

- APPROXIMATE BROWNFIELD DEVELOPMENT AREA BOUNDARY
- APPROXIMATE PROPERTY LINE, BRISTOL-MYERS SQUIBB
- DEMOLISHED BUILDING (AS OF JUNE 2019)
- EXISTING RAILROAD
- BUILDING 55 AREA LOCATION

NOTES:

1. BASEMAP SOURCE: MAP TITLED "BRISTOL-MYERS SQUIBB PART OF LOT 41 - TOWN OF DEWITT AND PART OF THE VILLAGE OF EAST SYRACUSE ONONDAGA COUNTY NEW YORK", DATED MARCH 25, 2010 PREPARED BY COTTRELL LAND SURVEYORS, P.C.. UPDATED BASED ON SUBSEQUENT AERIAL IMAGERY AND SITE VISITS.
2. SAMPLE LOCATIONS SURVEYED BY CT MALE ASSOCIATES, SYRACUSE, NY.
3. BUILDING 55, AS SHOWN IN THE FIGURE, IS THE FORMER SECURITY CENTER.

0 160' 320'

GRAPHIC SCALE

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY

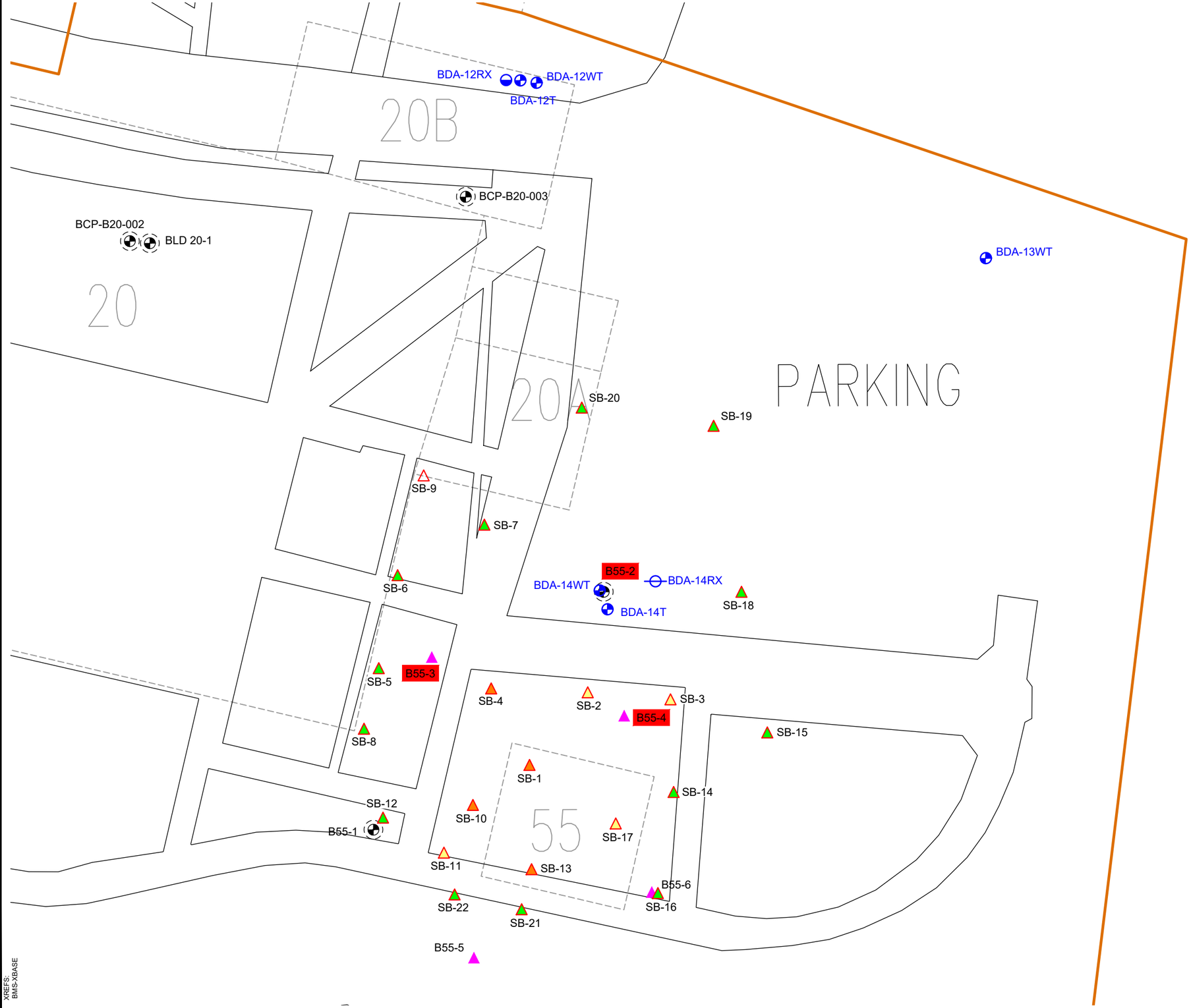
BUILDING 55 AREA IRM WORK PLAN

SITE PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

C:\Users\ms0285\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\01-DWG\02.16.2021B55_IRMWP-2021Q1-F02_SITE PLAN.dwg LAYOUT: 2 SAVED: 2/25/2021 12:16 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 225/2021 2:30 PM BY: M. SARAVANAPRIYA
XREFS:
BMS-XBASE



LEGEND:

- APPROXIMATE BROWNFIELD DEVELOPMENT AREA BOUNDARY
- DEMOLISHED BUILDING (AS OF JUNE 2019)
- 2020 SOIL BORING LOCATION WITH PID READINGS <250 ppm
- 2020 SOIL BORING LOCATION WITH PID READINGS 250 - 999 ppm
- 2020 SOIL BORING LOCATION WITH PID READINGS <1,000 ppm
- 2020 SOIL BORING LOCATION WITH SHALLOW REFUSAL
- PHASE 1/1A SOIL BORING (2013-2015)
- PHASE 1/1A DECOMMISSIONED OVERBURDEN MONITORING WELL (2013-2015)
- PHASE 2 OVERBURDEN MONITORING WELL (2016-2017)
- PHASE 2 BEDROCK MONITORING WELL (2017)
- ADDITIONAL BDA BEDROCK MONITORING WELL (2019)
- OBSERVED PID READING ABOVE 1,000 PPM IN PRE-2020 SOIL SAMPLING LOCATIONS

NOTES:

1. BASEMAP SOURCE: MAP TITLED "BRISTOL-MYERS SQUIBB PART OF LOT 41 - TOWN OF DEWITT AND PART OF THE VILLAGE OF EAST SYRACUSE ONONDAGA COUNTY NEW YORK", DATED MARCH 25, 2010 PREPARED BY COTTRELL LAND SURVEYORS, P.C.. UPDATED BASED ON SUBSEQUENT AERIAL IMAGERY AND SITE VISITS.
2. PRE-2020 SAMPLE LOCATIONS SURVEYED BY CT MALE ASSOCIATES, SYRACUSE, NY. 2020 SAMPLING LOCATIONS SURVEYED BY ARCADIS, SYRACUSE, NY.
3. SAMPLE LOCATION IDs ARE SHORTENED IN THE FIGURE FROM "B55-PDI-SB-" TO "SB-".
4. PID = PHOTOIONIZATION DETECTOR.
5. ppm = PARTS PER MILLION.

0 30' 60'

GRAPHIC SCALE

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY

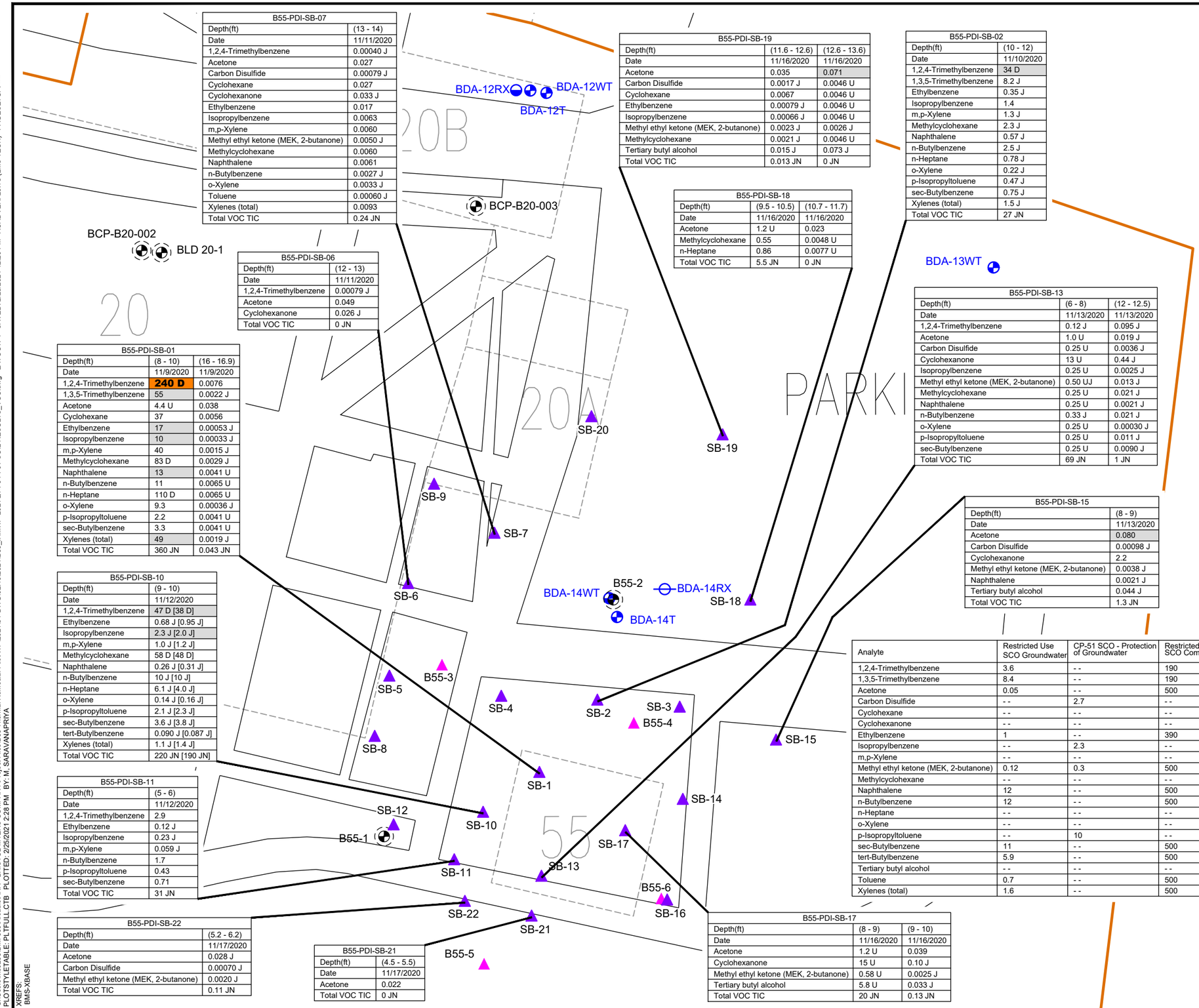
BUILDING 55 AREA IRM WORK PLAN

SOIL BORING LOCATIONS AND FIELD SCREENING RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

C:\Users\ms0285\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\01-DWG\02.16.2021\B55_JRMWP-2021Q1-F03-SOIL BORING LOCATIONS_Rev.dwg LAYOUT: 3 SAVED: 2/25/2021 12:19 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ----
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/25/2021 2:27 PM BY: M. SARAVANAPRIYA
XREFS:
BMS-XBASE



B55-PDI-SB-07	
Depth(ft)	(13 - 14)
Date	11/11/2020
1,2,4-Trimethylbenzene	0.00040 J
Acetone	0.027
Carbon Disulfide	0.00079 J
Cyclohexane	0.027
Cyclohexanone	0.033 J
Ethylbenzene	0.017
Isopropylbenzene	0.0063
m,p-Xylene	0.0060
Methyl ethyl ketone (MEK, 2-butanone)	0.0050 J
Methylcyclohexane	0.0060
Naphthalene	0.0061
n-Butylbenzene	0.0027 J
o-Xylene	0.0033 J
Toluene	0.00060 J
Xylenes (total)	0.0093
Total VOC TIC	0.24 JN

B55-PDI-SB-06	
Depth(ft)	(12 - 13)
Date	11/11/2020
1,2,4-Trimethylbenzene	0.00079 J
Acetone	0.049
Cyclohexanone	0.026 J
Total VOC TIC	0 JN

B55-PDI-SB-01		
Depth(ft)	(8 - 10)	(16 - 16.9)
Date	11/9/2020	11/9/2020
1,2,4-Trimethylbenzene	**240 D**	0.0076
1,3,5-Trimethylbenzene	55	0.0022 J
Acetone	4.4 U	0.038
Cyclohexane	37	0.0056
Ethylbenzene	17	0.00053 J
Isopropylbenzene	10	0.00033 J
m,p-Xylene	40	0.0015 J
Methylcyclohexane	83 D	0.0029 J
Naphthalene	13	0.0041 U
n-Butylbenzene	11	0.0065 U
n-Heptane	110 D	0.0065 U
o-Xylene	9.3	0.00036 J
p-Isopropyltoluene	2.2	0.0041 U
sec-Butylbenzene	3.3	0.0041 U
Xylenes (total)	49	0.0019 J
Total VOC TIC	360 JN	0.043 JN

B55-PDI-SB-10	
Depth(ft)	(9 - 10)
Date	11/12/2020
1,2,4-Trimethylbenzene	47 D [38 D]
Ethylbenzene	0.68 J [0.95 J]
Isopropylbenzene	2.3 J [2.0 J]
m,p-Xylene	1.0 J [1.2 J]
Methylcyclohexane	58 D [48 D]
Naphthalene	0.26 J [0.31 J]
n-Butylbenzene	10 J [10 J]
n-Heptane	6.1 J [4.0 J]
o-Xylene	0.14 J [0.16 J]
p-Isopropyltoluene	2.1 J [2.3 J]
sec-Butylbenzene	3.6 J [3.8 J]
tert-Butylbenzene	0.090 J [0.087 J]
Xylenes (total)	1.1 J [1.4 J]
Total VOC TIC	220 JN [190 JN]

B55-PDI-SB-11	
Depth(ft)	(5 - 6)
Date	11/12/2020
1,2,4-Trimethylbenzene	2.9
Ethylbenzene	0.12 J
Isopropylbenzene	0.23 J
m,p-Xylene	0.059 J
n-Butylbenzene	1.7
p-Isopropyltoluene	0.43
sec-Butylbenzene	0.71
Total VOC TIC	31 JN

B55-PDI-SB-22	
Depth(ft)	(5.2 - 6.2)
Date	11/17/2020
Acetone	0.028 J
Carbon Disulfide	0.00070 J
Methyl ethyl ketone (MEK, 2-butanone)	0.0020 J
Total VOC TIC	0.11 JN

B55-PDI-SB-21	
Depth(ft)	(4.5 - 5.5)
Date	11/17/2020
Acetone	0.022
Total VOC TIC	0 JN

B55-PDI-SB-19		
Depth(ft)	(11.6 - 12.6)	(12.6 - 13.6)
Date	11/16/2020	11/16/2020
Acetone	0.035	0.071
Carbon Disulfide	0.0017 J	0.0046 U
Cyclohexane	0.0067	0.0046 U
Ethylbenzene	0.00079 J	0.0046 U
Isopropylbenzene	0.00066 J	0.0046 U
Methyl ethyl ketone (MEK, 2-butanone)	0.0023 J	0.0026 J
Methylcyclohexane	0.0021 J	0.0046 U
Tertiary butyl alcohol	0.015 J	0.073 J
Total VOC TIC	0.013 JN	0 JN

B55-PDI-SB-18		
Depth(ft)	(9.5 - 10.5)	(10.7 - 11.7)
Date	11/16/2020	11/16/2020
Acetone	1.2 U	0.023
Methylcyclohexane	0.55	0.0048 U
n-Heptane	0.86	0.0077 U
Total VOC TIC	5.5 JN	0 JN

B55-PDI-SB-17		
Depth(ft)	(8 - 9)	(9 - 10)
Date	11/16/2020	11/16/2020
Acetone	1.2 U	0.039
Cyclohexanone	15 U	0.10 J
Methyl ethyl ketone (MEK, 2-butanone)	0.58 U	0.0025 J
Tertiary butyl alcohol	5.8 U	0.033 J
Total VOC TIC	20 JN	0.13 JN

B55-PDI-SB-02	
Depth(ft)	(10 - 12)
Date	11/10/2020
1,2,4-Trimethylbenzene	34 D
1,3,5-Trimethylbenzene	8.2 J
Ethylbenzene	0.35 J
Isopropylbenzene	1.4
m,p-Xylene	1.3 J
Methylcyclohexane	2.3 J
Naphthalene	0.57 J
n-Butylbenzene	2.5 J
n-Heptane	0.78 J
o-Xylene	0.22 J
p-Isopropyltoluene	0.47 J
sec-Butylbenzene	0.75 J
Xylenes (total)	1.5 J
Total VOC TIC	27 JN

B55-PDI-SB-13		
Depth(ft)	(6 - 8)	(12 - 12.5)
Date	11/13/2020	11/13/2020
1,2,4-Trimethylbenzene	0.12 J	0.095 J
Acetone	1.0 U	0.019 J
Carbon Disulfide	0.25 U	0.0036 J
Cyclohexanone	13 U	0.44 J
Isopropylbenzene	0.25 U	0.0025 J
Methyl ethyl ketone (MEK, 2-butanone)	0.50 UJ	0.013 J
Methylcyclohexane	0.25 U	0.021 J
Naphthalene	0.25 U	0.0021 J
n-Butylbenzene	0.33 J	0.021 J
o-Xylene	0.25 U	0.00030 J
p-Isopropyltoluene	0.25 U	0.011 J
sec-Butylbenzene	0.25 U	0.0090 J
Total VOC TIC	69 JN	1 JN

B55-PDI-SB-15	
Depth(ft)	(8 - 9)
Date	11/13/2020
Acetone	0.080
Carbon Disulfide	0.00098 J
Cyclohexanone	2.2
Methyl ethyl ketone (MEK, 2-butanone)	0.0038 J
Naphthalene	0.0021 J
Tertiary butyl alcohol	0.044 J
Total VOC TIC	1.3 JN

Analyte	Restricted Use SCO Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCO Commercial
1,2,4-Trimethylbenzene	3.6	- -	190
1,3,5-Trimethylbenzene	8.4	- -	190
Acetone	0.05	- -	500
Carbon Disulfide	- -	2.7	- -
Cyclohexane	- -	- -	- -
Cyclohexanone	- -	- -	- -
Ethylbenzene	1	- -	390
Isopropylbenzene	- -	2.3	- -
m,p-Xylene	- -	- -	- -
Methyl ethyl ketone (MEK, 2-butanone)	0.12	0.3	500
Methylcyclohexane	- -	- -	- -
Naphthalene	12	- -	500
n-Butylbenzene	12	- -	500
n-Heptane	- -	- -	- -
o-Xylene	- -	- -	- -
p-Isopropyltoluene	- -	10	- -
sec-Butylbenzene	11	- -	500
tert-Butylbenzene	5.9	- -	500
Tertiary butyl alcohol	- -	- -	- -
Toluene	0.7	- -	500
Xylenes (total)	1.6	- -	500

LEGEND:

- APPROXIMATE BROWNFIELD DEVELOPMENT AREA BOUNDARY
- DEMOLISHED BUILDING (AS OF JUNE 2019)
- 2020 SOIL BORING LOCATION
- PHASE 1/1A SOIL BORING (2013-2015)
- PHASE 1/1A DECOMMISSIONED OVERBURDEN MONITORING WELL (2013-2015)
- PHASE 2 OVERBURDEN MONITORING WELL (2016-2017)
- PHASE 2 BEDROCK MONITORING WELL (2017)
- ADDITIONAL BDA BEDROCK MONITORING WELL (2019)

NOTES:

1. BASEMAP SOURCE: MAP TITLED "BRISTOL-MYERS SQUIBB PART OF LOT 41 - TOWN OF DEWITT AND PART OF THE VILLAGE OF EAST SYRACUSE ONONDAGA COUNTY NEW YORK", DATED MARCH 25, 2010 PREPARED BY COTTRELL LAND SURVEYORS, P.C.. UPDATED BASED ON SUBSEQUENT AERIAL IMAGERY AND SITE VISITS.
2. PRE-2020 SAMPLE LOCATIONS SURVEYED BY CT MALE ASSOCIATES, SYRACUSE, NY. 2020 SAMPLING LOCATIONS SURVEYED BY ARCADIS, SYRACUSE, NY.
3. ALL RESULTS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg). DUPLICATE RESULTS ARE SHOWN IN BRACKETS.
4. ALL SAMPLES ANALYZED IN ACCORDANCE WITH USEPA SW-846 METHOD 8260C FOR VOLATILE ORGANIC COMPOUNDS (VOC).
5. ONLY DETECTED CONCENTRATIONS ARE SHOWN IN DATA BOXES.
6. ORANGE SHADED AND BLACK BOLDED RESULTS PRESENTED IN DATA BOXES SHOW CONCENTRATIONS THAT EXCEED THE 6 NYCRR PART 375-6 COMMERCIAL SOIL CLEANUP OBJECTIVES (SCO). GRAY SHADED RESULTS PRESENTED IN DATA BOXES SHOW CONCENTRATIONS THAT EXCEED THE NYSDEC CP-51 OR 6 NYCRR PART 375-6 PROTECTION OF GROUNDWATER SCO.
7. DATA QUALIFIERS:
   D = CONCENTRATION BASED ON DILUTED SAMPLE ANALYSIS.
   J = ESTIMATED CONCENTRATION. RESULTS IS GREATER THAN THE MDL BUT LESS THAN THE RL.
   N = PRESUMPTIVE EVIDENCE OF MATERIAL.
   U = NOT DETECTED AT ASSOCIATED QUANTITATION LIMIT.
8. TIC = TENTATIVELY IDENTIFIED COMPOUND.
9. - - = NO SCO FOR ANALYTE.

0 30' 60'

GRAPHIC SCALE

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY

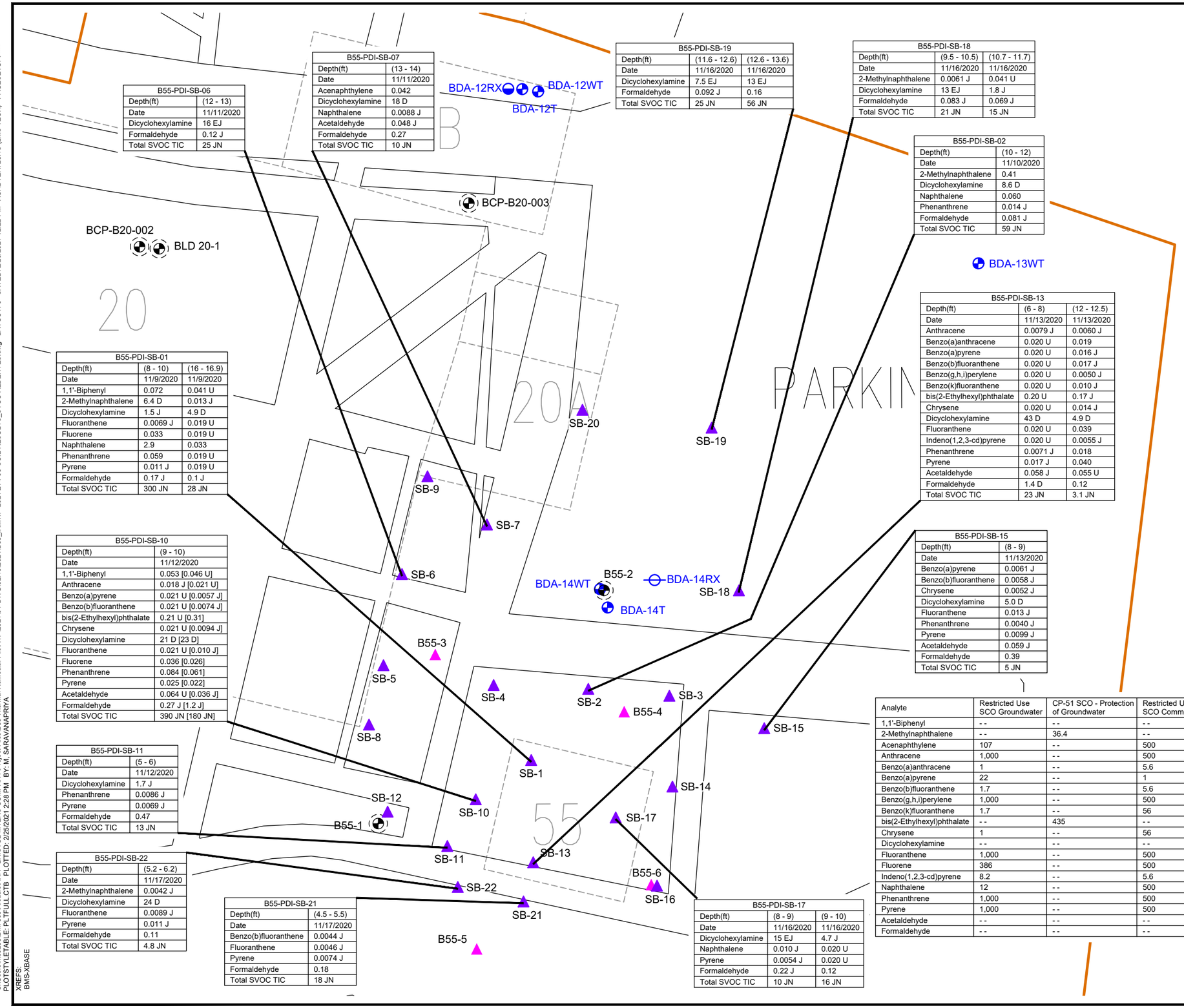
BUILDING 55 AREA IRM WORK PLAN

SOIL ANALYTICAL RESULTS - VOC

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

C:\Users\ms0285\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\01-DWG\02.16.2021\B55_ JRMWP-2021Q1-F04-F01-SOIL RESULTS_VOC.dwg LAYOUT: 4 SAVED: 2/25/2021 12:20 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/25/2021 2:28 PM BY: M. SARAVANAPRIYA
XREFS:
BMS-XBASE



B55-PDI-SB-06	
Depth(ft)	(12 - 13)
Date	11/11/2020
Dicyclohexylamine	16 EJ
Formaldehyde	0.12 J
Total SVOC TIC	25 JN

B55-PDI-SB-07	
Depth(ft)	(13 - 14)
Date	11/11/2020
Acenaphthylene	0.042
Dicyclohexylamine	18 D
Naphthalene	0.0088 J
Acetaldehyde	0.048 J
Formaldehyde	0.27
Total SVOC TIC	10 JN

B55-PDI-SB-19		
Depth(ft)	(11.6 - 12.6)	(12.6 - 13.6)
Date	11/16/2020	11/16/2020
Dicyclohexylamine	7.5 EJ	13 EJ
Formaldehyde	0.092 J	0.16
Total SVOC TIC	25 JN	56 JN

B55-PDI-SB-18		
Depth(ft)	(9.5 - 10.5)	(10.7 - 11.7)
Date	11/16/2020	11/16/2020
2-Methylnaphthalene	0.0061 J	0.041 U
Dicyclohexylamine	13 EJ	1.8 J
Formaldehyde	0.083 J	0.069 J
Total SVOC TIC	21 JN	15 JN

B55-PDI-SB-02	
Depth(ft)	(10 - 12)
Date	11/10/2020
2-Methylnaphthalene	0.41
Dicyclohexylamine	8.6 D
Naphthalene	0.060
Phenanthrene	0.014 J
Formaldehyde	0.081 J
Total SVOC TIC	59 JN

B55-PDI-SB-13		
Depth(ft)	(6 - 8)	(12 - 12.5)
Date	11/13/2020	11/13/2020
Anthracene	0.0079 J	0.0060 J
Benzo(a)anthracene	0.020 U	0.019
Benzo(a)pyrene	0.020 U	0.016 J
Benzo(b)fluoranthene	0.020 U	0.017 J
Benzo(g,h,i)perylene	0.020 U	0.0050 J
Benzo(k)fluoranthene	0.020 U	0.010 J
bis(2-Ethylhexyl)phthalate	0.20 U	0.17 J
Chrysene	0.020 U	0.014 J
Dicyclohexylamine	43 D	4.9 D
Fluoranthene	0.020 U	0.039
Indeno(1,2,3-cd)pyrene	0.020 U	0.0055 J
Phenanthrene	0.0071 J	0.018
Pyrene	0.017 J	0.040
Acetaldehyde	0.058 J	0.055 U
Formaldehyde	1.4 D	0.12
Total SVOC TIC	23 JN	3.1 JN

B55-PDI-SB-01		
Depth(ft)	(8 - 10)	(16 - 16.9)
Date	11/9/2020	11/9/2020
1,1'-Biphenyl	0.072	0.041 U
2-Methylnaphthalene	6.4 D	0.013 J
Dicyclohexylamine	1.5 J	4.9 D
Fluoranthene	0.0069 J	0.019 U
Fluorene	0.033	0.019 U
Naphthalene	2.9	0.033
Phenanthrene	0.059	0.019 U
Pyrene	0.011 J	0.019 U
Formaldehyde	0.17 J	0.1 J
Total SVOC TIC	300 JN	28 JN

B55-PDI-SB-15	
Depth(ft)	(8 - 9)
Date	11/13/2020
Benzo(a)pyrene	0.0061 J
Benzo(b)fluoranthene	0.0058 J
Chrysene	0.0052 J
Dicyclohexylamine	5.0 D
Fluoranthene	0.013 J
Phenanthrene	0.0040 J
Pyrene	0.0099 J
Acetaldehyde	0.059 J
Formaldehyde	0.39
Total SVOC TIC	5 JN

B55-PDI-SB-10	
Depth(ft)	(9 - 10)
Date	11/12/2020
1,1'-Biphenyl	0.053 [0.046 U]
Anthracene	0.018 J [0.021 U]
Benzo(a)pyrene	0.021 U [0.0057 J]
Benzo(b)fluoranthene	0.021 U [0.0074 J]
bis(2-Ethylhexyl)phthalate	0.21 U [0.31]
Chrysene	0.021 U [0.0094 J]
Dicyclohexylamine	21 D [23 D]
Fluoranthene	0.021 U [0.010 J]
Fluorene	0.036 [0.026]
Phenanthrene	0.084 [0.061]
Pyrene	0.025 [0.022]
Acetaldehyde	0.064 U [0.036 J]
Formaldehyde	0.27 J [1.2 J]
Total SVOC TIC	390 JN [180 JN]

B55-PDI-SB-11	
Depth(ft)	(5 - 6)
Date	11/12/2020
Dicyclohexylamine	1.7 J
Phenanthrene	0.0086 J
Pyrene	0.0069 J
Formaldehyde	0.47
Total SVOC TIC	13 JN

Analyte	Restricted Use SCO Groundwater	CP-51 SCO - Protection of Groundwater	Restricted Use SCO Commercial
1,1'-Biphenyl	- -	- -	- -
2-Methylnaphthalene	- -	36.4	- -
Acenaphthylene	107	- -	500
Anthracene	1,000	- -	500
Benzo(a)anthracene	1	- -	5.6
Benzo(a)pyrene	22	- -	1
Benzo(b)fluoranthene	1.7	- -	5.6
Benzo(g,h,i)perylene	1,000	- -	500
Benzo(k)fluoranthene	1.7	- -	56
bis(2-Ethylhexyl)phthalate	- -	435	- -
Chrysene	1	- -	56
Dicyclohexylamine	- -	- -	- -
Fluoranthene	1,000	- -	500
Fluorene	386	- -	500
Indeno(1,2,3-cd)pyrene	8.2	- -	5.6
Naphthalene	12	- -	500
Phenanthrene	1,000	- -	500
Pyrene	1,000	- -	500
Acetaldehyde	- -	- -	- -
Formaldehyde	- -	- -	- -

B55-PDI-SB-22	
Depth(ft)	(5.2 - 6.2)
Date	11/17/2020
2-Methylnaphthalene	0.0042 J
Dicyclohexylamine	24 D
Fluoranthene	0.0089 J
Pyrene	0.011 J
Formaldehyde	0.11
Total SVOC TIC	4.8 JN

B55-PDI-SB-21	
Depth(ft)	(4.5 - 5.5)
Date	11/17/2020
Benzo(b)fluoranthene	0.0044 J
Fluoranthene	0.0046 J
Pyrene	0.0074 J
Formaldehyde	0.18
Total SVOC TIC	18 JN

B55-PDI-SB-17		
Depth(ft)	(8 - 9)	(9 - 10)
Date	11/16/2020	11/16/2020
Dicyclohexylamine	15 EJ	4.7 J
Naphthalene	0.010 J	0.020 U
Pyrene	0.0054 J	0.020 U
Formaldehyde	0.22 J	0.12
Total SVOC TIC	10 JN	16 JN

LEGEND:

- APPROXIMATE BROWNFIELD DEVELOPMENT AREA BOUNDARY
- DEMOLISHED BUILDING (AS OF JUNE 2019)
- 2020 SOIL BORING LOCATION
- PHASE 1/1A SOIL BORING (2013-2015)
- PHASE 1/1A DECOMMISSIONED OVERBURDEN MONITORING WELL (2013-2015)
- PHASE 2 OVERBURDEN MONITORING WELL (2016-2017)
- PHASE 2 BEDROCK MONITORING WELL (2017)
- ADDITIONAL BDA BEDROCK MONITORING WELL (2019)

NOTES:

1. BASEMAP SOURCE: MAP TITLED "BRISTOL-MYERS SQUIBB PART OF LOT 41 - TOWN OF DEWITT AND PART OF THE VILLAGE OF EAST SYRACUSE ONONDAGA COUNTY NEW YORK", DATED MARCH 25, 2010 PREPARED BY COTTRELL LAND SURVEYORS, P.C.. UPDATED BASED ON SUBSEQUENT AERIAL IMAGERY AND SITE VISITS.
2. PRE-2020 SAMPLE LOCATIONS SURVEYED BY CT MALE ASSOCIATES, SYRACUSE, NY. 2020 SAMPLING LOCATIONS SURVEYED BY ARCADIS, SYRACUSE, NY.
3. ALL RESULTS ARE IN MICROGRAMS PER LITER (ug/L). DUPLICATE RESULTS ARE SHOWN IN BRACKETS.
4. ALL SAMPLES ANALYZED IN ACCORDANCE WITH USEPA SW-846 METHOD 8270D FOR SEMIVOLATILE ORGANIC COMPOUNDS, AND USEPA SW-846 METHOD 8315A FOR ALDEHYDES.
5. ONLY DETECTED CONCENTRATIONS ARE SHOWN IN DATA BOXES.
6. SOIL ANALYTICAL RESULTS FOR SVOC AND ALDEHYDES DO NOT EXCEED THE 6 NYCRR PART 375-6 COMMERCIAL SOIL CLEANUP OBJECTIVES (SCO), THE 6 NYCRR PART 375-6 PROTECTION OF GROUNDWATER SCO, OR THE NYSDEC CP-51 PROTECTION OF GROUNDWATER SCO.
7. DATA QUALIFIERS:
   D = CONCENTRATION BASED ON DILUTED SAMPLE ANALYSIS.
   E = ESTIMATED CONCENTRATION. RESULT IS LESS THAN THE REPORTING LIMIT (RL) BUT EQUAL TO THE METHOD DETECTION LIMIT (MDL).
   J = ESTIMATED CONCENTRATION. RESULTS IS GREATER THAN THE MDL BUT LESS THAN THE RL.
   N = PRESUMPTIVE EVIDENCE OF MATERIAL.
   U = NOT DETECTED AT ASSOCIATED QUANTITATION LIMIT.
8. TIC = TENTATIVELY IDENTIFIED COMPOUND.
9. - - = NO SCO FOR ANALYTE.

0 30' 60'

GRAPHIC SCALE

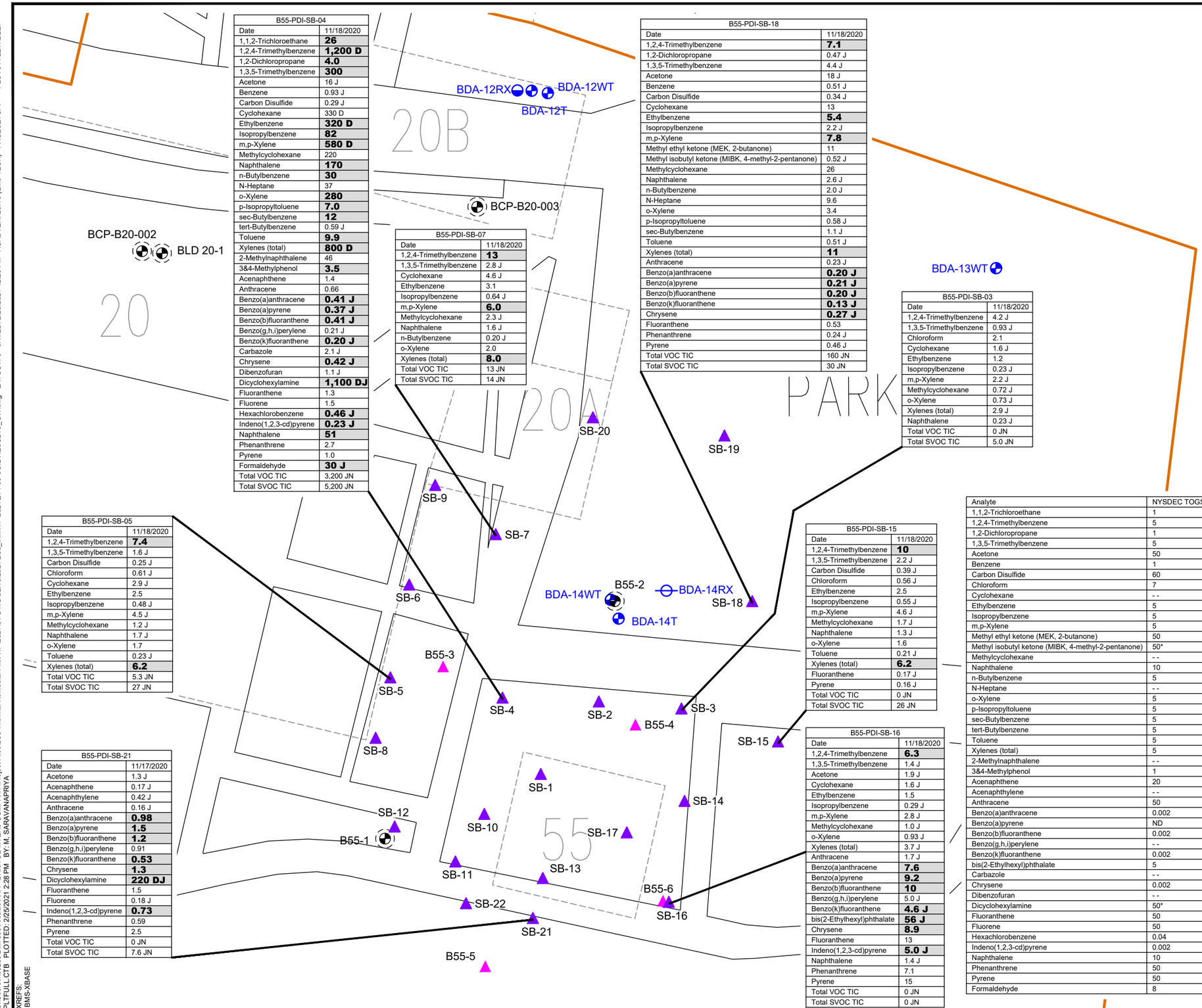
SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY
BUILDING 55 AREA IRM WORK PLAN

SOIL ANALYTICAL RESULTS - SVOC AND ALDEHYDES

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

C:\Users\ms0285\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\01-DWG\02.16.2021B55_IRMWP-2021Q1-F05-SOIL RESULTS_SVOC ALDEHYES.dwg LAYOUT: 5 SAVED: 2/25/2021 12:22 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ----
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/25/2021 2:28 PM BY: M. SARAVANAPRIYA
XREFS:
BMS-XBASE



B55-PDI-SB-04	
Date	11/18/2020
1,1,2-Trichloroethane	**26**
1,2,4-Trimethylbenzene	**1,200 D**
1,2-Dichloropropane	**4.0**
1,3,5-Trimethylbenzene	**300**
Acetone	16 J
Benzene	0.93 J
Carbon Disulfide	0.29 J
Cyclohexane	330 D
Ethylbenzene	**320 D**
Isopropylbenzene	**82**
m,p-Xylene	**580 D**
Methylcyclohexane	220
Naphthalene	**170**
n-Butylbenzene	**30**
N-Heptane	37
o-Xylene	**280**
p-Isopropyltoluene	**7.0**
sec-Butylbenzene	**12**
tert-Butylbenzene	0.59 J
Toluene	**9.9**
Xylenes (total)	**800 D**
2-Methylnaphthalene	46
3&4-Methylphenol	**3.5**
Acenaphthene	1.4
Anthracene	0.66
Benzo(a)anthracene	**0.41 J**
Benzo(a)pyrene	**0.37 J**
Benzo(b)fluoranthene	**0.41 J**
Benzo(g,h,i)perylene	0.21 J
Benzo(k)fluoranthene	**0.20 J**
Carbazole	2.1 J
Chrysene	**0.42 J**
Dibenzofuran	1.1 J
Dicyclohexylamine	**1,100 DJ**
Fluoranthene	1.3
Fluorene	1.5
Hexachlorobenzene	**0.46 J**
Indeno(1,2,3-cd)pyrene	**0.23 J**
Naphthalene	**51**
Phenanthrene	2.7
Pyrene	1.0
Formaldehyde	**30 J**
Total VOC TIC	3,200 JN
Total SVOC TIC	5,200 JN

B55-PDI-SB-07	
Date	11/18/2020
1,2,4-Trimethylbenzene	**13**
1,3,5-Trimethylbenzene	2.8 J
Cyclohexane	4.6 J
Ethylbenzene	3.1
Isopropylbenzene	0.64 J
m,p-Xylene	**6.0**
Methylcyclohexane	2.3 J
Naphthalene	1.6 J
n-Butylbenzene	0.20 J
o-Xylene	2.0
Xylenes (total)	**8.0**
Total VOC TIC	13 JN
Total SVOC TIC	14 JN

B55-PDI-SB-18	
Date	11/18/2020
1,2,4-Trimethylbenzene	**7.1**
1,2-Dichloropropane	0.47 J
1,3,5-Trimethylbenzene	4.4 J
Acetone	18 J
Benzene	0.51 J
Carbon Disulfide	0.34 J
Cyclohexane	13
Ethylbenzene	**5.4**
Isopropylbenzene	2.2 J
m,p-Xylene	**7.8**
Methyl ethyl ketone (MEK, 2-butanone)	11
Methyl isobutyl ketone (MIBK, 4-methyl-2-pentanone)	0.52 J
Methylcyclohexane	26
Naphthalene	2.6 J
n-Butylbenzene	2.0 J
N-Heptane	9.6
o-Xylene	3.4
p-Isopropyltoluene	0.58 J
sec-Butylbenzene	1.1 J
Toluene	0.51 J
Xylenes (total)	**11**
Anthracene	0.23 J
Benzo(a)anthracene	**0.20 J**
Benzo(a)pyrene	**0.21 J**
Benzo(b)fluoranthene	**0.20 J**
Benzo(k)fluoranthene	**0.13 J**
Chrysene	**0.27 J**
Fluoranthene	0.53
Phenanthrene	0.24 J
Pyrene	0.46 J
Total VOC TIC	160 JN
Total SVOC TIC	30 JN

B55-PDI-SB-03	
Date	11/18/2020
1,2,4-Trimethylbenzene	4.2 J
1,3,5-Trimethylbenzene	0.93 J
Chloroform	2.1
Cyclohexane	1.6 J
Ethylbenzene	1.2
Isopropylbenzene	0.23 J
m,p-Xylene	2.2 J
Methylcyclohexane	0.72 J
o-Xylene	0.73 J
Xylenes (total)	2.9 J
Naphthalene	0.23 J
Total VOC TIC	0 JN
Total SVOC TIC	5.0 JN

B55-PDI-SB-05	
Date	11/18/2020
1,2,4-Trimethylbenzene	**7.4**
1,3,5-Trimethylbenzene	1.6 J
Carbon Disulfide	0.25 J
Chloroform	0.61 J
Cyclohexane	2.9 J
Ethylbenzene	2.5
Isopropylbenzene	0.48 J
m,p-Xylene	4.5 J
Methylcyclohexane	1.2 J
Naphthalene	1.7 J
o-Xylene	1.7
Toluene	0.23 J
Xylenes (total)	**6.2**
Total VOC TIC	5.3 JN
Total SVOC TIC	27 JN

B55-PDI-SB-15	
Date	11/18/2020
1,2,4-Trimethylbenzene	**10**
1,3,5-Trimethylbenzene	2.2 J
Carbon Disulfide	0.39 J
Chloroform	0.56 J
Ethylbenzene	2.5
Isopropylbenzene	0.55 J
m,p-Xylene	4.6 J
Methylcyclohexane	1.7 J
Naphthalene	1.3 J
o-Xylene	1.6
Toluene	0.21 J
Xylenes (total)	**6.2**
Fluoranthene	0.17 J
Pyrene	0.16 J
Total VOC TIC	0 JN
Total SVOC TIC	26 JN

B55-PDI-SB-21	
Date	11/17/2020
Acetone	1.3 J
Acenaphthene	0.17 J
Acenaphthylene	0.42 J
Anthracene	0.16 J
Benzo(a)anthracene	**0.98**
Benzo(a)pyrene	**1.5**
Benzo(b)fluoranthene	**1.2**
Benzo(g,h,i)perylene	0.91
Benzo(k)fluoranthene	**0.53**
Chrysene	**1.3**
Dicyclohexylamine	**220 DJ**
Fluoranthene	1.5
Fluorene	0.18 J
Indeno(1,2,3-cd)pyrene	**0.73**
Phenanthrene	0.59
Pyrene	2.5
Total VOC TIC	0 JN
Total SVOC TIC	7.6 JN

B55-PDI-SB-16	
Date	11/18/2020
1,2,4-Trimethylbenzene	**6.3**
1,3,5-Trimethylbenzene	1.4 J
Acetone	1.9 J
Cyclohexane	1.6 J
Ethylbenzene	1.5
Isopropylbenzene	0.29 J
m,p-Xylene	2.8 J
Methylcyclohexane	1.0 J
o-Xylene	0.93 J
Xylenes (total)	3.7 J
Anthracene	1.7 J
Benzo(a)anthracene	**7.6**
Benzo(a)pyrene	**9.2**
Benzo(b)fluoranthene	**10**
Benzo(g,h,i)perylene	5.0 J
Benzo(k)fluoranthene	**4.6 J**
bis(2-Ethylhexyl)phthalate	**56 J**
Chrysene	**8.9**
Fluoranthene	13
Indeno(1,2,3-cd)pyrene	**5.0 J**
Naphthalene	1.4 J
Phenanthrene	7.1
Pyrene	15
Total VOC TIC	0 JN
Total SVOC TIC	0 JN

Analyte	NYSDEC TOGS 1.1.1
1,1,2-Trichloroethane	1
1,2,4-Trimethylbenzene	5
1,2-Dichloropropane	1
1,3,5-Trimethylbenzene	5
Acetone	50
Benzene	1
Carbon Disulfide	60
Chloroform	7
Cyclohexane	- -
Ethylbenzene	5
Isopropylbenzene	5
m,p-Xylene	5
Methyl ethyl ketone (MEK, 2-butanone)	50
Methyl isobutyl ketone (MIBK, 4-methyl-2-pentanone)	50*
Methylcyclohexane	- -
Naphthalene	10
n-Butylbenzene	5
N-Heptane	- -
o-Xylene	5
p-Isopropyltoluene	5
sec-Butylbenzene	5
tert-Butylbenzene	5
Toluene	5
Xylenes (total)	5
2-Methylnaphthalene	- -
3&4-Methylphenol	1
Acenaphthene	20
Acenaphthylene	- -
Anthracene	50
Benzo(a)anthracene	0.002
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	0.002
Benzo(g,h,i)perylene	- -
Benzo(k)fluoranthene	0.002
bis(2-Ethylhexyl)phthalate	5
Carbazole	- -
Chrysene	0.002
Dibenzofuran	- -
Dicyclohexylamine	50*
Fluoranthene	50
Fluorene	50
Hexachlorobenzene	0.04
Indeno(1,2,3-cd)pyrene	0.002
Naphthalene	10
Phenanthrene	50
Pyrene	50
Formaldehyde	8

LEGEND:

- APPROXIMATE BROWNFIELD DEVELOPMENT AREA BOUNDARY
- DEMOLISHED BUILDING (AS OF JUNE 2019)
- 2020 SOIL BORING LOCATION
- PHASE 1/1A SOIL BORING (2013-2015)
- PHASE 1/1A DECOMMISSIONED OVERBURDEN MONITORING WELL (2013-2015)
- PHASE 2 OVERBURDEN MONITORING WELL (2016-2017)
- PHASE 2 BEDROCK MONITORING WELL (2017)
- ADDITIONAL BDA BEDROCK MONITORING WELL (2019)

NOTES:

1. BASEMAP SOURCE: MAP TITLED "BRISTOL-MYERS SQUIBB PART OF LOT 41 - TOWN OF DEWITT AND PART OF THE VILLAGE OF EAST SYRACUSE ONONDAGA COUNTY NEW YORK", DATED MARCH 25, 2010 PREPARED BY COTTRELL LAND SURVEYORS, P.C.. UPDATED BASED ON SUBSEQUENT AERIAL IMAGERY AND SITE VISITS.
2. PRE-2020 SAMPLE LOCATIONS SURVEYED BY CT MALE ASSOCIATES, SYRACUSE, NY. 2020 SAMPLING LOCATIONS SURVEYED BY ARCADIS, SYRACUSE, NY.
3. ALL RESULTS ARE IN MICROGRAMS PER LITER (ug/L).
4. ALL SAMPLES ANALYZED IN ACCORDANCE WITH USEPA SW-846 METHOD 8260C FOR VOLATILE ORGANIC COMPOUNDS, USEPA SW-846 METHOD 8270D FOR SEMIVOLATILE ORGANIC COMPOUNDS AND USEPA SW-846 METHOD 8315A FOR ALDEHYDES.
5. ONLY DETECTED CONCENTRATIONS ARE SHOWN IN DATA BOXES.
6. GRAY SHADED AND BLACK BOLDED RESULTS PRESENTED IN DATA BOXES SHOW CONCENTRATIONS THAT EXCEED THE NYSDEC TOGS 1.1.1 (TOGS) CRITERIA OR A DEFAULT SCREENING VALUE OF 50 ug/L FOR PURPOSES OF THIS REPORT (INDICATED BY *).
7. DATA QUALIFIERS:
   D = CONCENTRATION BASED ON DILUTED SAMPLE ANALYSIS.
   J = ESTIMATED CONCENTRATION. RESULTS IS GREATER THAN THE MDL BUT LESS THAN THE RL.
   N = PRESUMPTIVE EVIDENCE OF MATERIAL.
   U = NOT DETECTED AT ASSOCIATED QUANTITATION LIMIT.
8. TIC = TENTATIVELY IDENTIFIED COMPOUND.
9. - - = NO TOGS 1.1.1 GROUNDWATER STANDARD OR GUIDANCE VALUE FOR ANALYTE.

0 30' 60'

GRAPHIC SCALE

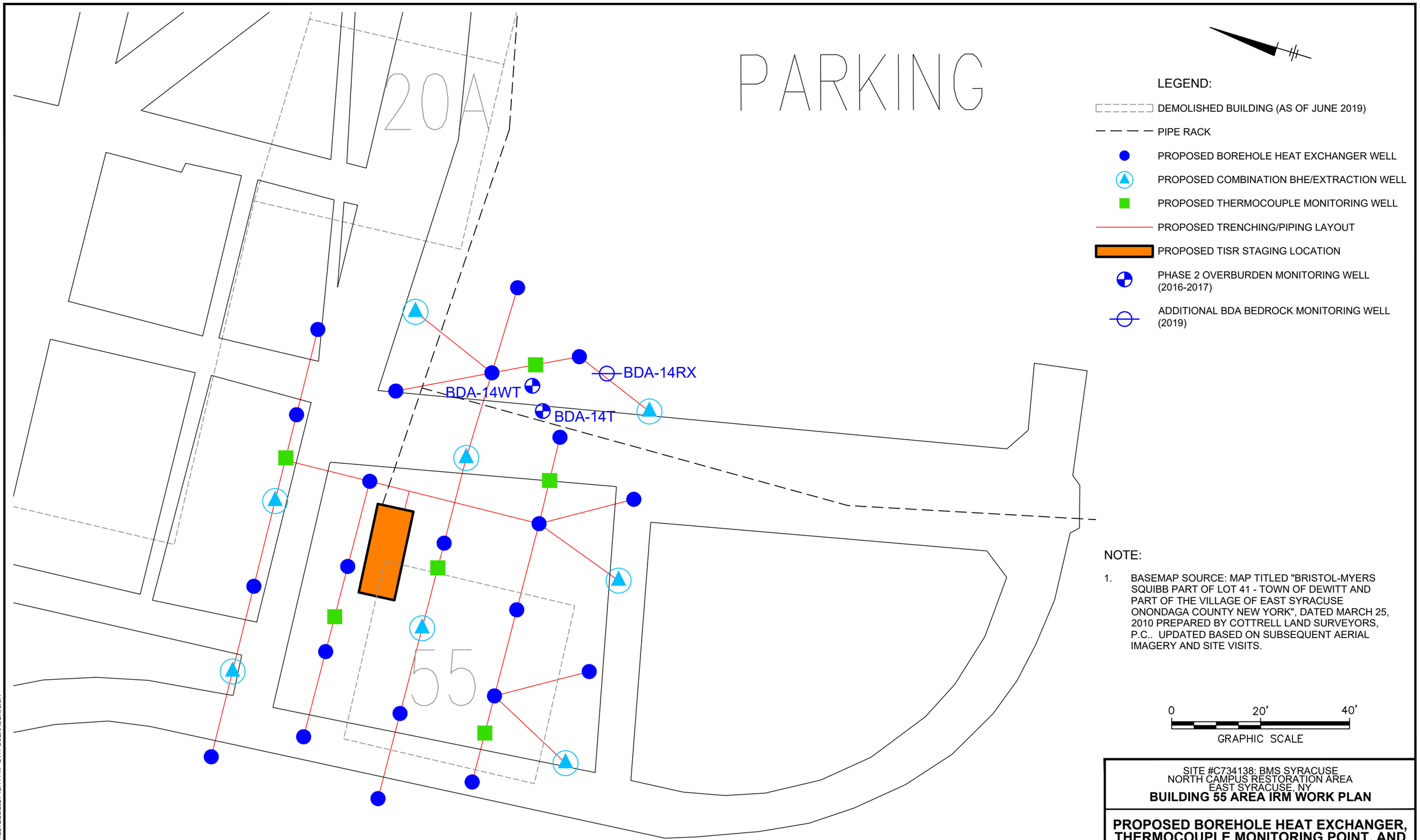
SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY
BUILDING 55 AREA IRM WORK PLAN

GROUNDWATER ANALYTICAL RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6

C:\Users\ms0285\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\01-DWG\02.16.2021\B55_IRMWP-2021Q1-F06-SOIL RESULTS_GW.dwg LAYOUT: 6 SAVED: 2/25/2021 12:23 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/25/2021 2:28 PM BY: M. SARAVANAPRIYA
XREFS:
BMS-XBASE



NOTE:

1. BASEMAP SOURCE: MAP TITLED "BRISTOL-MYERS SQUIBB PART OF LOT 41 - TOWN OF DEWITT AND PART OF THE VILLAGE OF EAST SYRACUSE ONONDAGA COUNTY NEW YORK", DATED MARCH 25, 2010 PREPARED BY COTTRELL LAND SURVEYORS, P.C.. UPDATED BASED ON SUBSEQUENT AERIAL IMAGERY AND SITE VISITS.

0 20' 40'

GRAPHIC SCALE

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY

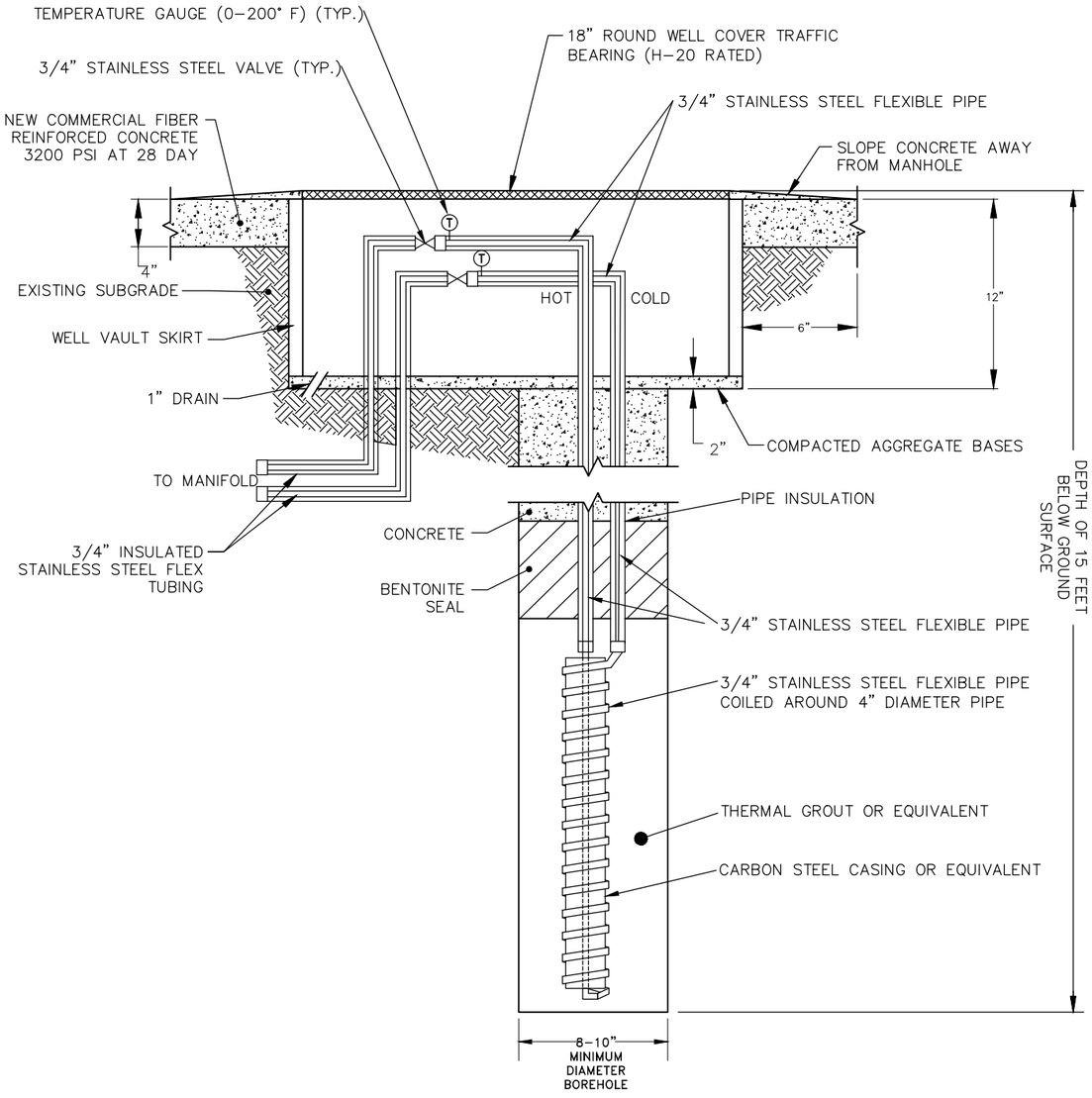
BUILDING 55 AREA IRM WORK PLAN

PROPOSED BOREHOLE HEAT EXCHANGER, THERMOCOUPLE MONITORING POINT, AND TRENCHING/PIPING LAYOUT

ARCADIS Design & Consultancy for natural and built assets

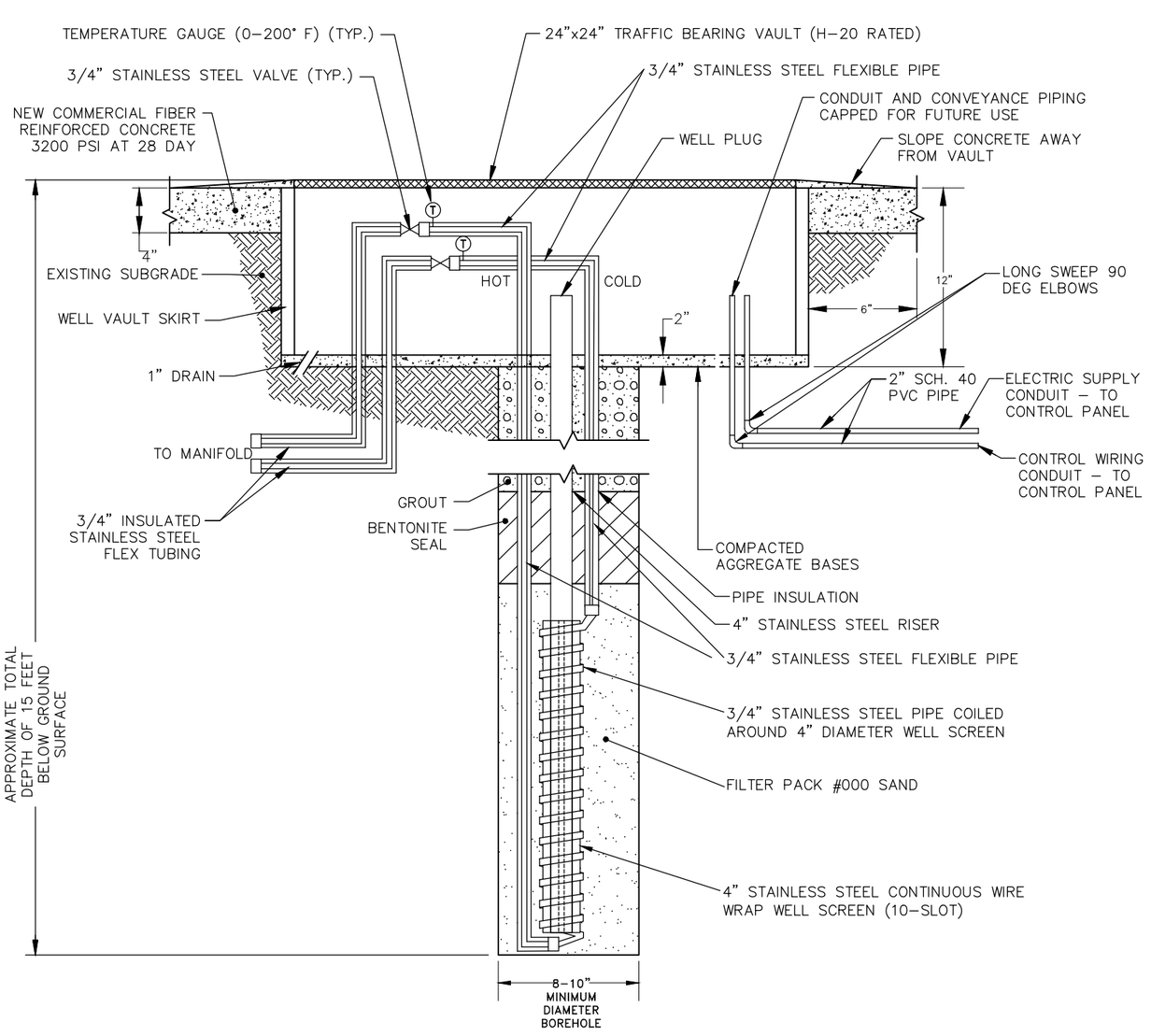
FIGURE 7

C:\Users\lposenauer\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\20210101-DWG\02.16.2021\B55_IRMWP_FIG07_PP BHE TRENCH.dwg LAYOUT: 7 SAVED: 2/26/2021 12:40 PM ACADVER: 24.0S (LMS TECH) PAGESETUP: C-LB-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/26/2021 12:41 PM BY: POSENAUER, LISA
XREFS:
BMS-XBASE



BOREHOLE HEAT EXCHANGER

NOT TO SCALE



COMBINATION BOREHOLE HEAT EXCHANGER/EXTRACTION WELL

NOT TO SCALE

NOTES:
1. HDPE = HIGH DENSITY POLYETHYLENE.
2. PSI = POUNDS PER SQUARE INCH.
3. PVC = POLYVINYL CHLORIDE.

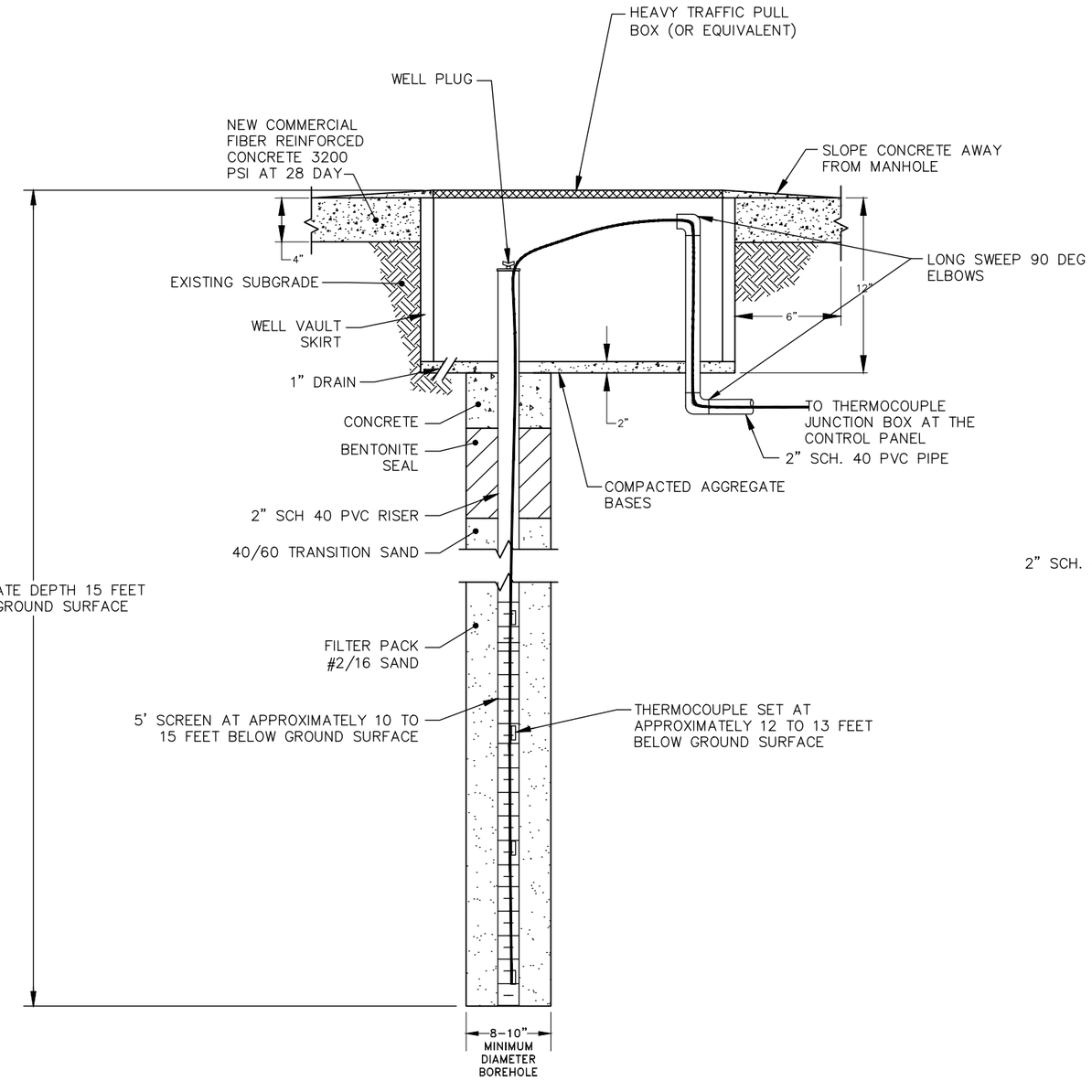
SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY
BUILDING 55 AREA IRM WORK PLAN

BOREHOLE HEAT EXCHANGER AND BOREHOLE HEAT EXCHANGER/EXTRACTION WELL DETAILS

ARCADIS Design & Consultancy for natural and built assets

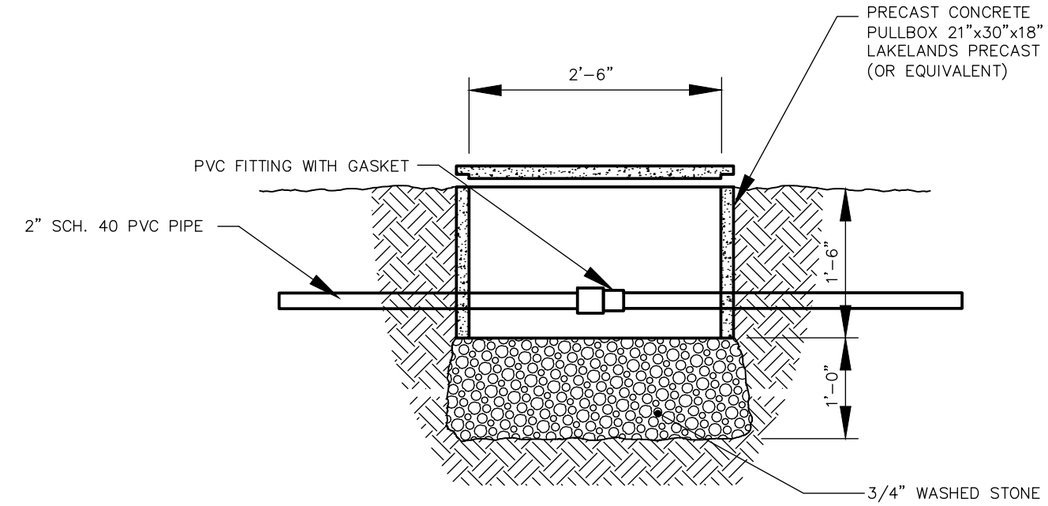
FIGURE
8

C:\Users\posenauer\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\01-DWG\02.16.2021\B55_IRMWP_FIG08-09_CONSTUCTION DTL.dwg LAYOUT: 8 SAVED: 2/25/2021 12:51 PM ACADVER: 24.0S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/25/2021 2:13 PM BY: POSENAUER, LISA



THERMOCOUPLE MONITORING POINT

NOT TO SCALE



PULL BOX DETAIL

NOT TO SCALE

NOTES:
1. PSI = POUNDS PER SQUARE INCH.
2. PVC = POLYVINYL CHLORIDE.

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY
BUILDING 55 AREA IRM WORK PLAN

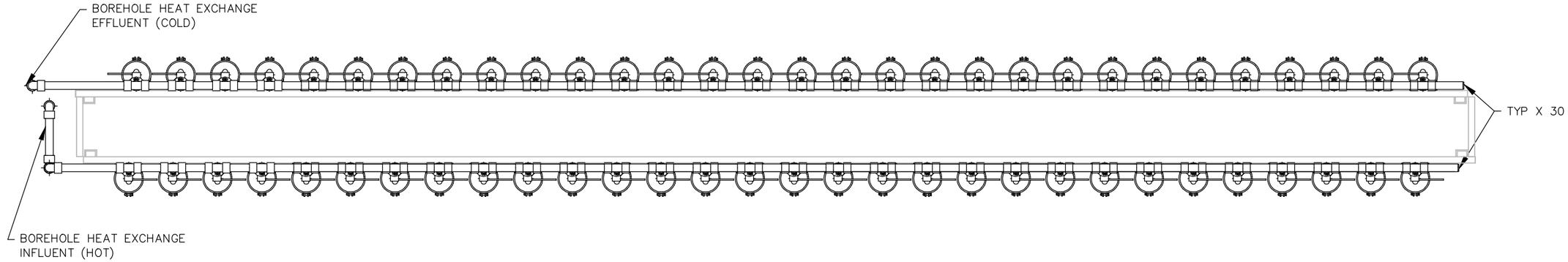
THERMOCOUPLE MONITORING POINT DETAILS

ARCADIS Design & Consultancy for natural and built assets

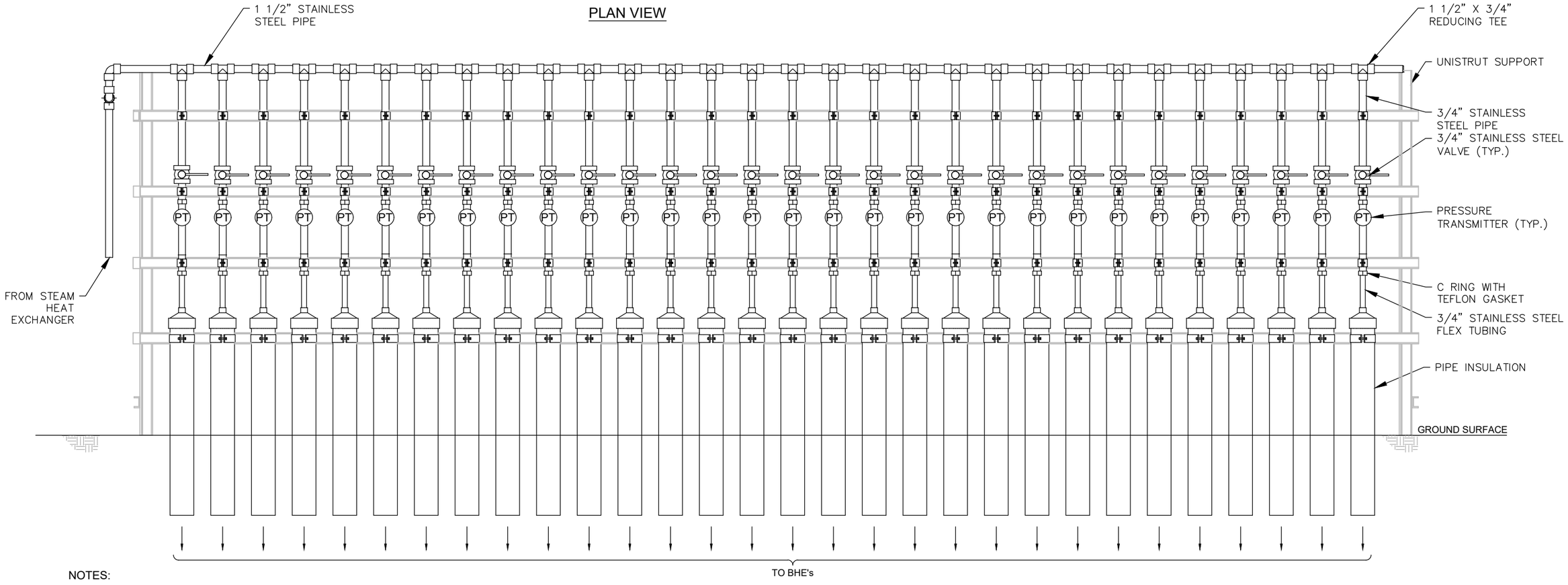
FIGURE
9

C:\Users\ms0285\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021101-DWG\02.16.2021\B55_IRMWP_FIG08-09_CONSTUCTION DTL.dwg LAYOUT: 9 SAVED: 2/23/2021 3:52 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/25/2021 12:39 PM BY: M. SARAVANAPRIYA

C:\Users\jadhavp8954\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\3006505\02-01-DWG\B55_IRMWP_FIG10_TR CS and MANIFOLD DTL.dwg LAYOUT: 10 SAVED: 3/19/2021 11:14 AM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/19/2021 11:16 AM BY: JADHAV, PRAJAKTA



PLAN VIEW



ELEVATION VIEW

NOTES:

1. ALL PIPING SHALL BE INSULATED WHERE POSSIBLE.
2. BOREHOLE HEAT EXCHANGER EFFLUENT (COLD) MANIFOLD TO HAVE TEMPERATURE INDICATING TRANSMITTER AND FLOW INDICATING TRANSMITTER ON EACH LINE AND SHALL BE VISIBLE FROM THE FRONT SIDE.
3. VENDOR SHALL INDICATE THE SIZE OF THE OPENING WITHIN THE FLOOR OF THE ENCLOSURE TO ACCOMMODATE PIPING PENETRATION TO THE GROUND.

MANIFOLD DETAILS

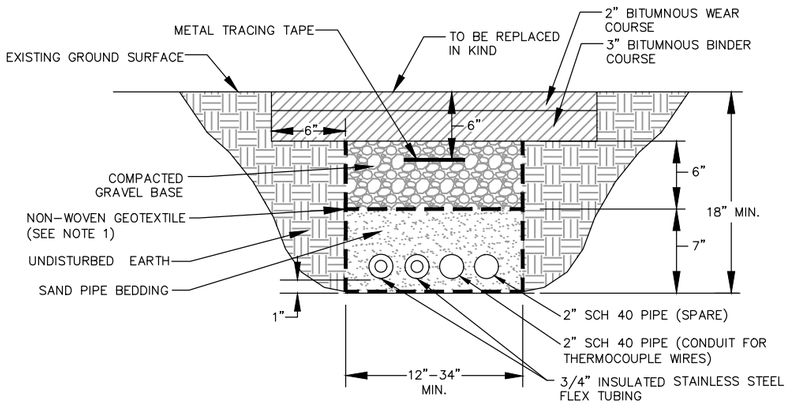
NOT TO SCALE

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY
BUILDING 55 AREA IRM WORK PLAN

MANIFOLD DETAILS

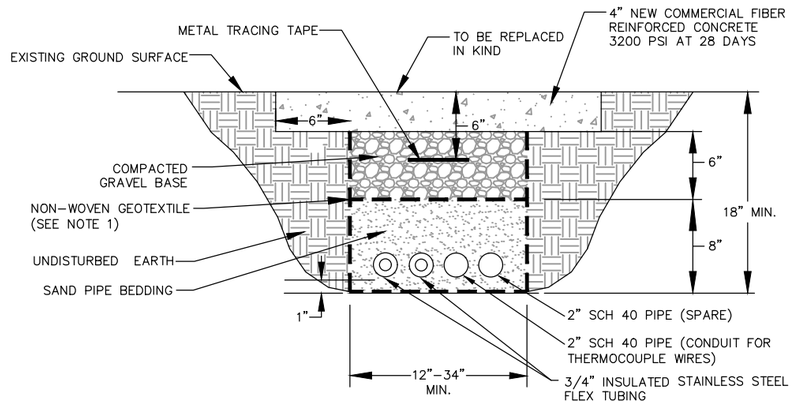
ARCADIS Design & Consultancy for natural and built assets

FIGURE
10



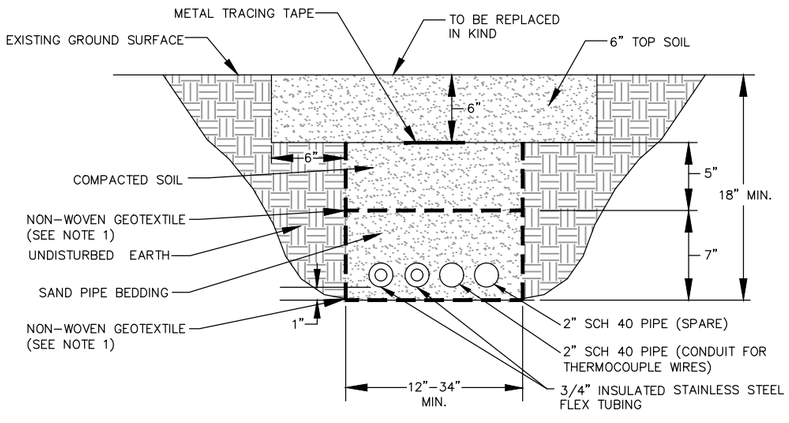
TYPICAL ASPHALT COMPLETION DETAIL

NOT TO SCALE



TYPICAL CONCRETE COMPLETION DETAIL

NOT TO SCALE



TYPICAL VEGETATIVE COVER COMPLETION DETAIL

NOT TO SCALE

NOTES:

1. THE TRENCH BOTTOM AND SIDEWALLS WILL BE LINED WITH A DEMARCATION LAYER CONSISTING OF NON-WOVEN GEOTEXTILE TO SEPARATE KNOWN CLEAN SOILS FROM POTENTIALLY CONTAMINATED, UNDERLYING SOILS.

2. ALL IMPORTED FILL MUST BE APPROVE BY THE ENGINEER AND THE NYSDEC BEFORE PLACEMENT. ALL IMPORTED FILL MUST MEET THE REQUIREMENTS OF 6 NYCRR 375-6.7(d), DER-10 section 5.4(e), AND NYSDEC's PFAS GUIDELINES. TICKETS/BILLS-OF-LADING OR SIMILAR MUST BE INCLUDED WITH EACH LOAD THAT CLEARLY SHOWS THE LOAD ORIGINATED FROM THE APPROVED SOURCE.

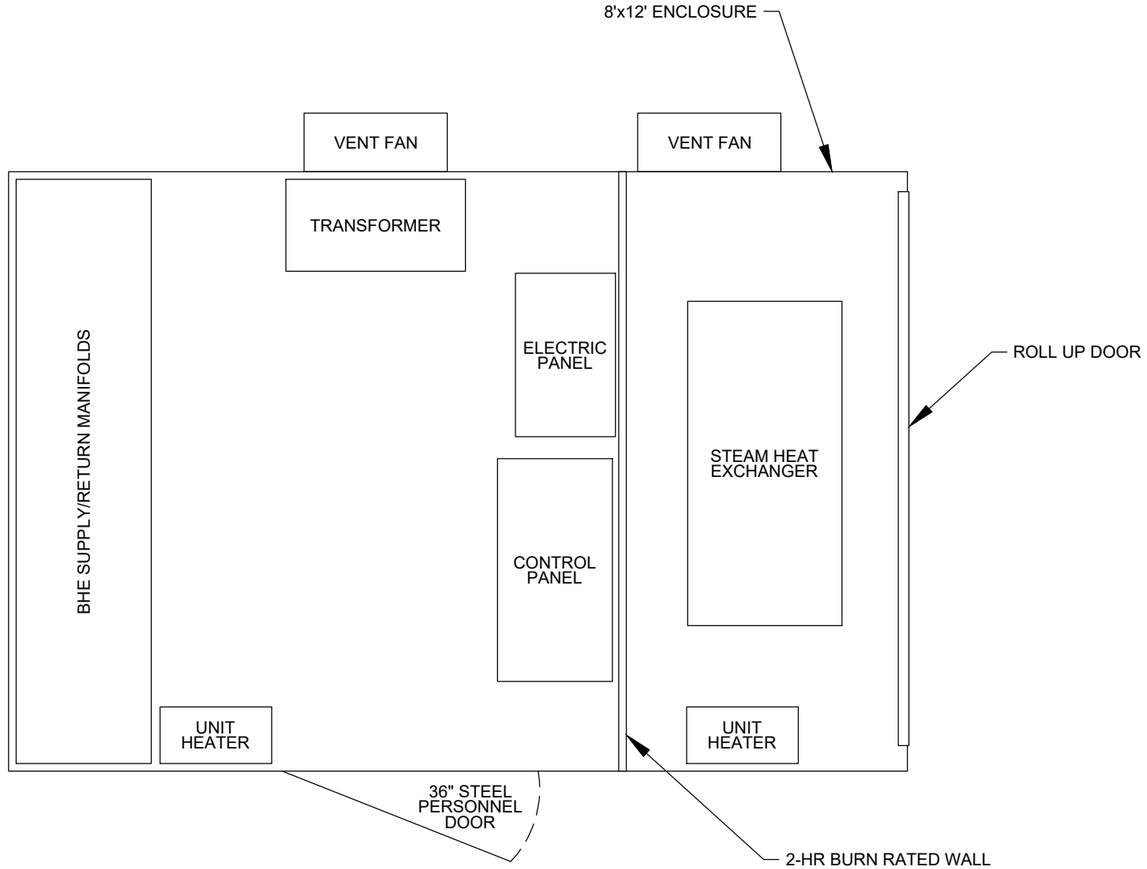
SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY
BUILDING 55 AREA IRM WORK PLAN

TRENCH CROSS SECTION DETAILS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
11

C:\Users\posenauer\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\01-DWG\02.16.2021B55_IRMWP_FIG10_TR CS and MANIFOLD DTL.dwg LAYOUT: 11 SAVED: 2/25/2021 2:17 PM ACADVER: 24.0S (LMS TECH) PAGESETUP: ----
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/25/2021 2:59 PM BY: POSENAUER, LISA



NOTE:

1. SYSTEM TO BE PLACED ON 6-INCH COMPACTED MODIFIED GRAVEL UNDERLINE BY 8 OZ NON-WOVEN GEOTEXTILE
2. SYSTEM TO BE ANCHORED VIA EARTHEN ANCHORS AT EACH CORNER

NOT TO SCALE

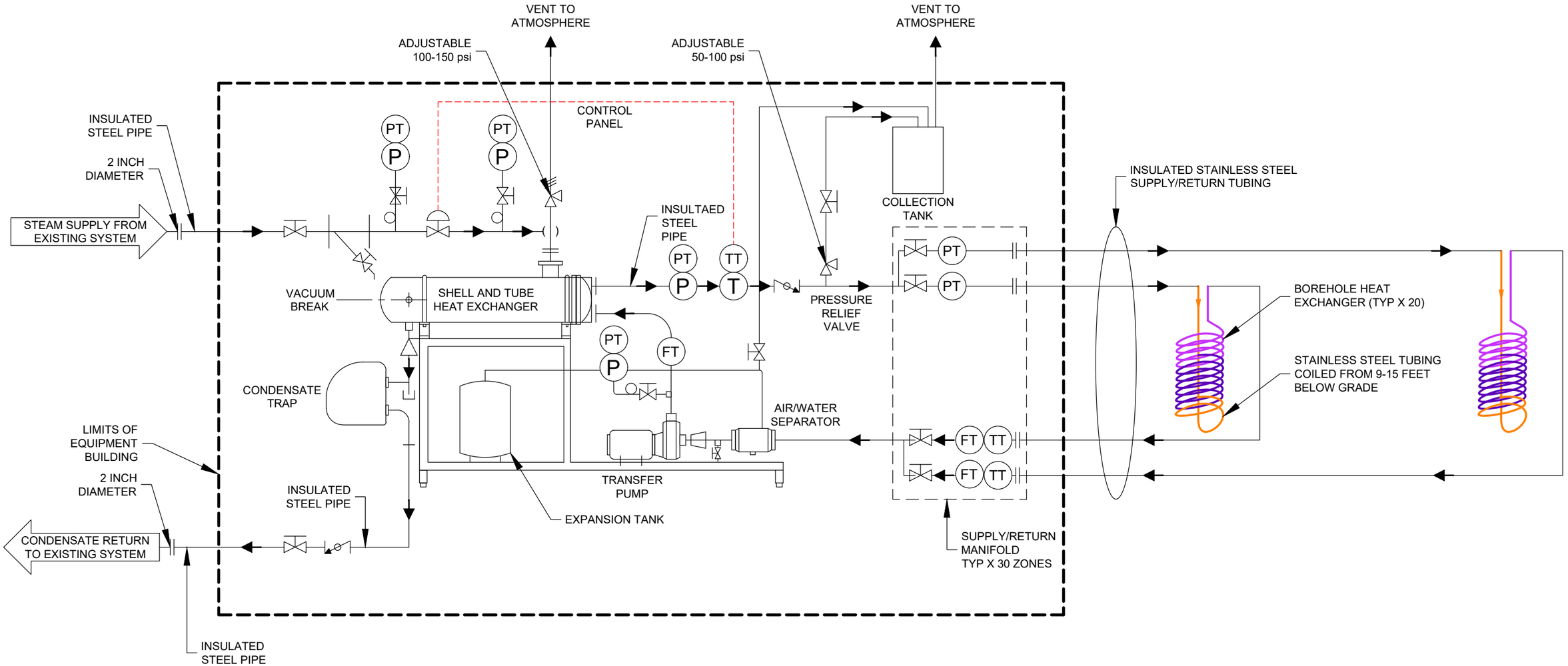
SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY
BUILDING 55 AREA IRM WORK PLAN

TISR[SM] ENCLOSURE LAYOUT

ARCADIS Design & Consultancy for natural and built assets

FIGURE
12

C:\Users\jadhavp8954\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\tB55 Thermal Remedial Pilot WP\2021\3006505201-DWG\tB55_JRMWP_FIG11-12_E
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/19/2021 11:00 AM BY: JADHAV, PRAJAKTA
_FIG11-12_BLDG LAYOUT and PID.dwg LAYOUT: 2 SAVED: 3/19/2021 10:57 AM ACADVER: 23.1S (LMS TECH) PAGESETUP: ----



LEGEND:

- FLOW DIRECTION
- MANUAL SHUT OFF
- STRAINER
- PRESSURE GAUGE
- TEMP CONTROL VALVE
- PRESSURE RELIEF VALVE
- TEMPERATURE GAUGE
- CHECK VALVE
- PRESSURE TRANSMITTER
- FLOW TRANSMITTER
- TEMPERATURE TRANSMITTER

NOT TO SCALE

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY

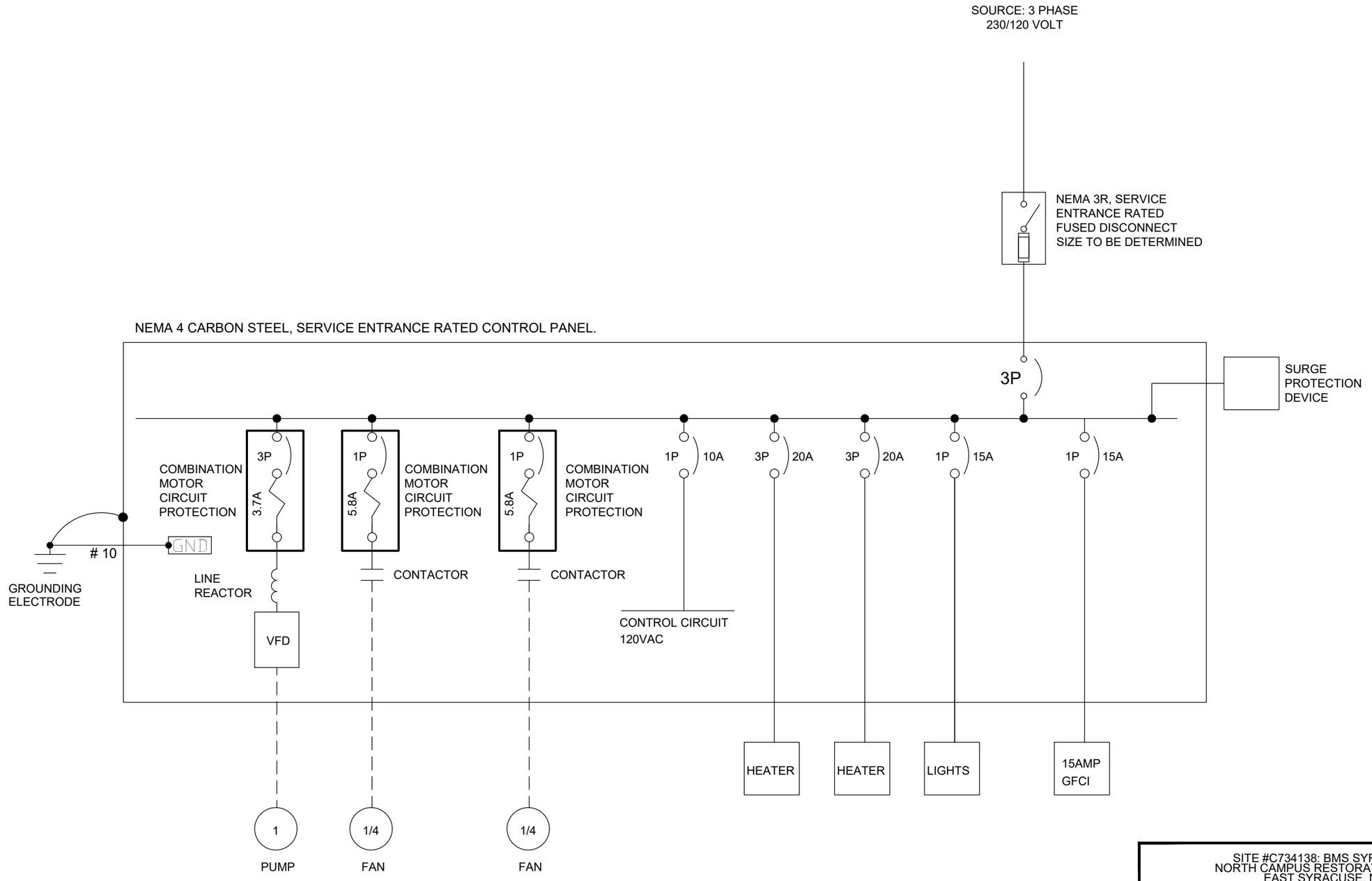
BUILDING 55 AREA IRM WORK PLAN

PROCESS AND INSTRUMENTATION DIAGRAM

ARCADIS Design & Consultancy for natural and built assets

FIGURE 13

C:\Users\jadhavp8954\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\3006505201-DWG\B55_IRMWP_FIG11-12_BLDG LAYOUT and PID.dwg LAYOUT: 3 SAVED: 3/19/2021 12:21 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ----
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/19/2021 12:30 PM BY: JADHAV, PRAJAKTA



NOTES:

1. ALL SIZING IS TO BE DETERMINED BASED ON FINAL SYSTEM DESIGN AND AVAILABLE POWER.
2. ALL ELECTRICAL COMPONENTS WILL COMPLY WITH LOCAL, STATE AND FEDERAL REGULATIONS.

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY

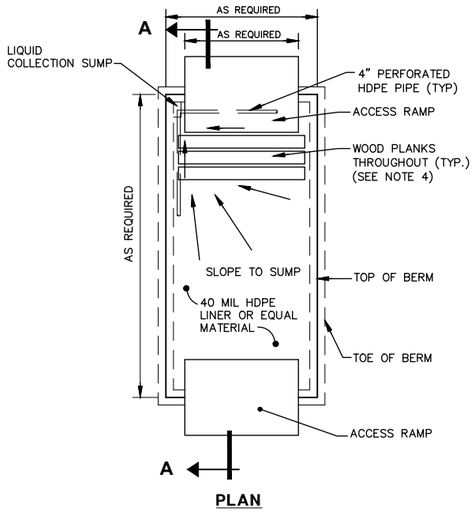
BUILDING 55 AREA IRM WORK PLAN

TYPICAL ELECTRICAL ONE LINE

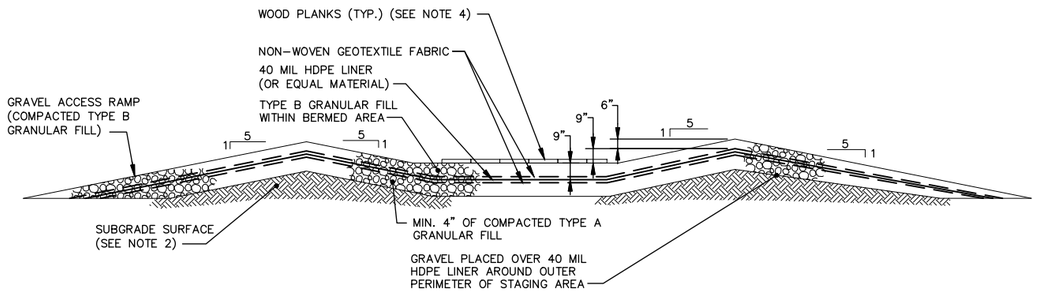
ARCADIS Design & Consultancy for natural and built assets

FIGURE
14

C:\Users\jadhavp8954\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\30065052\01-DWG\B55_IRMWP_FIG13_TYP ONE LINE.dwg LAYOUT: 5 SAVED: 3/19/2021 11:34 AM ACADVER: 23.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/19/2021 11:36 AM BY: JADHAV, PRAJAKTA



PLAN



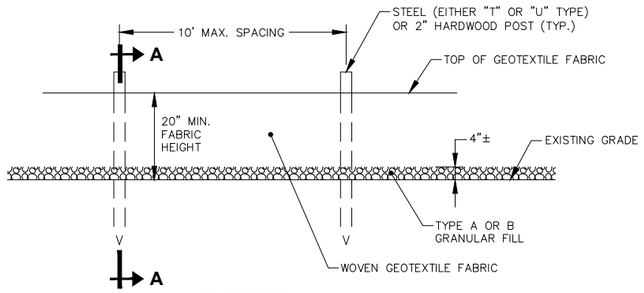
SECTION A

NOTES:

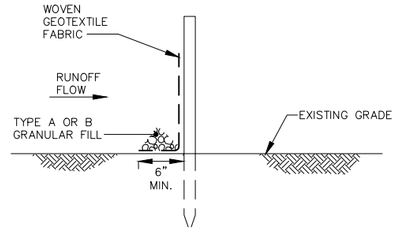
1. LOCATION(S) AND DIMENSIONS OF EQUIPMENT DECONTAMINATION AREA(S) TO BE DETERMINED PRIOR TO CONSTRUCTION.
2. SUBGRADE SURFACE TO BE UNIFORM AND FREE OF MATERIALS THAT COULD DAMAGE THE LINER (E.G., SHARP STONES, WOODY DEBRIS, CONSTRUCTION DEBRIS).
3. DECONTAMINATION AREA TO BE SLOPED TOWARD COLLECTION SUMP TO FACILITATE REMOVAL OF WASH FLUIDS.
4. WOOD PLANKS TO BE PLACED ABOVE THE GRAVEL DRAINAGE LAYER THROUGHOUT THE WORKING SURFACE OF THE DECONTAMINATION AREA TO PROVIDE A STABLE SURFACE FOR VEHICLES AND EQUIPMENT TO BE DECONTAMINATED.
5. HDPE = HIGH DENSITY POLYETHYLENE.

EXAMPLE VEHICLE/EQUIPMENT DECONTAMINATION AREA

NOT TO SCALE



ELEVATION



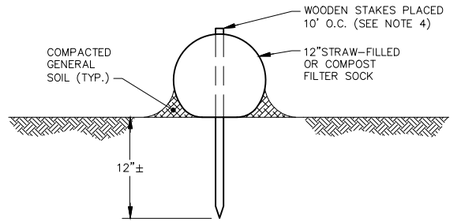
SECTION A-A

NOTES:

1. BOTTOM PORTION OF GEOTEXTILE WILL BE LAID FLAT ON THE UP-GRADIENT OR PROJECT SIDE OF THE FENCE AND HELD IN PLACE WITH A CONTINUOUS PILE OF TYPE A OR B GRANULAR FILL.
2. WHEN TWO SECTIONS OF GEOTEXTILE FABRIC ADJOIN EACH OTHER THEY WILL BE OVERLAPPED A MINIMUM OF 6 INCHES AND FOLDED.
3. SEDIMENT DEPOSITS WILL BE REMOVED AS GENERATED.
4. SILT FENCE WILL BE REMOVED AFTER PROJECT ACTIVITIES HAVE BEEN COMPLETED.

SILT FENCE

NOT TO SCALE



NOTES:

1. TRAFFIC WILL NOT BE PERMITTED TO CROSS FILTER SOCK.
2. ACCUMULATED SEDIMENT WILL BE REMOVED AS IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK OR AS DIRECTED BY CONSTRUCTION MANAGER.
3. SOCKS WILL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS WILL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED AS SOON AS PRACTICABLE.
4. PLACE HEAVY CONCRETE BLOCKS ON SANDBAGS BEHIND FILTER SOCK WHEN STAKING IS NOT POSSIBLE.

STRAW-FILLED OR COMPOST FILTER SOCK

NOT TO SCALE

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY
BUILDING 55 AREA IRM WORK PLAN

MISCELLANOUS DETAILS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
15

C:\Users\ms0286\BIM 360\Arcadis\ANA - BRISTOL-MYERS COMPANY\Project Files\B55 Thermal Remedial Pilot WP\2021\01-DWG\02.16.2021\B55_IRMWP_FIG14_MISC DETAILS.dwg LAYOUT: 15 SAVED: 2/23/2021 3:26 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/25/2021 12:45 PM BY: M. SARAVANAPRIYA

APPENDIX A

Soil Boring Logs

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-01**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-09-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-10-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 19

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1–4	3.0		ND		(0.0-4.5') SILT; some sand, fine; little gravel, fine to medium, angular to subangular; clay; moist; soft; dark brown (10YR 3/3); trace organics (roots).	
5–7	2.5				(4.5-7.5') SILT; some clay, non plastic to slight plasticity; moist; stiff; brown (10YR 4/3).	
8			308.4		(7.5-8.0') SILT; some clay, non plastic; little sand, fine; trace gravel, fine, subangular; wet, black (10YR 2/1).	
9		B55-PDI-SB-01 (8-10)	725.3		(8.0-8.6') SILT; some clay, non plastic to slight plasticity; moist; stiff; brown (10YR 4/3); degraded petroleum-like odor.	
10–11	3.3		1,808		(8.6-12.0') SAND, fine; little to trace silt; wet; soft; dark brown (10YR 3/3); strong degraded petroleum-like odor. Iridescent sheen at 8.6' bgs.	Backfilled to surface with bentonite pellets
12–16	3.6		0.8		(12.0-16.9') SAND, fine; little to trace silt; wet to saturated; soft to slightly stiff; moderate liquefaction; brown (10YR 3/3).	
17–18	2.7	B55-PDI-SB-01 (16-16.9)	ND		(16.9-19.0') SAND, fine; some silt; little gravel, fine, subangular; moist; stiff; reddish-brown (5YR 4/4) . [TILL]	
19					End of boring at 19.0' bgs.	

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.
A grab groundwater sample was collected prior to abandonment of the borehole.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☒ No ☐
Surface Elevation (feet): 414.095
Northing: 1116947.762
Easting: 953257.002

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-02**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-10-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-10-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 20

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1–4	3.3		ND		(0.0-4.0') SILT; some clay, non plastic; little gravel, fine to medium, subangular; little to trace organics (roots); soft to stiff; moist; dark brown (10YR 2/3).	
5–8	3.4		ND		(4.0-9.9') SILT; some clay; trace sand, fine; increasing clay content with depth; moist; soft becoming stiff; brown (10YR 4/3).	
9–12	3.9	B55-PDI-SB-02 (10-12)	487.7 8.5		(9.9-18.6') SAND, fine; little silt; wet; soft; moderate liquefaction; (10YR 3/1) transitioning to (10YR 4/3) very dark gray to brown. Degraded petroleum-like odor.	Backfilled to surface with bentonite pellets
13–16	3.9					
17–18	2.4		ND			
19–20					(18.6-20.0') SILT; some sand, fine; little gravel, fine to medium, subangular; trace clay; moist; stiff; reddish-brown (5YR 4/4). [TILL]	

End of boring at 20.0' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 414.525
Northing: 1116937.307
Easting: 953282.962

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-03**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-10-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-10-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 20

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1–4	3.1		ND		(0.0-0.5') SAND, fine; little silt; moist; soft; dark brown (10YR 3/3); organics (roots). (0.5-3.2') SILT; some clay; little gravel, fine to medium, subangular; moist; medium stiff; reddish-brown (5YR 4/3).	
4–8	3.1		ND		(3.2-8.9') CLAY; little silt, non plastic; moist to wet; stiff becoming very stiff; very dark gray (10YR 3/1); transitioning to brown (10YR 4/3) in color.	
8–12	3.4		457.4		(8.9-18.0') SAND, fine; little to trace silt; wet; soft to slightly stiff; black (10YR 2/1) becoming brown (10YR 3/3) at 9.9' bgs. Heaving sands from 12-16' bgs.	Backfilled to surface with bentonite pellets
12–16	4.0		ND			
16–18	4.0		ND		(18.0-20.0') SILT; some sand, fine; little gravel, fine to medium, subangular; trace clay; moist; stiff; reddish-brown (5YR 4/4) . [TILL]	
18–20					End of boring at 20.0' bgs.	

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.
A grab groundwater sample was collected prior to abandonment of the borehole.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☒ No ☐
Surface Elevation (feet): 414.561
Northing: 1116912.882
Easting: 953288.126

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-04**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-10-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-10-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 20

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1–4	NM		ND		(0.0-4.0') (Hand Cleared) SILT; some sand, fine; little to some gravel, fine to coarse, subangular; moist; soft to stiff; very dark brown (10YR 2/2); trace organics and red brick. [FILL]	Backfilled to surface with bentonite pellets
5–8	2.3				(4.0-12.0') SILT; some clay, non plastic to slight plasticity; little to trace fine sand; brown (10YR 4/3).	
9–12	2.7				Zone of (5RP 6/2) pale red purple staining at 9.4-9.5' bgs and 10.6 to 10.7' bgs.	
12			>2,000		Interbedded fine sand seams at 11.5 to 11.6' bgs and 11.8 to 12.0' bgs, (10YR 3/1) very dark gray in color.	
13–16	3.8				(12.0-16.6') SAND, fine; interbedded with silt and clay; wet to saturated; soft; liquefaction; brown (10YR 4/3).	
17–20	3.6				(16.6-20.0') SAND, fine; some silt; little gravel, fine, subangular; trace clay; wet becoming moist; soft becoming stiff; reddish-brown (5YR 4/4) . [TILL]	
					End of boring at 20.0' bgs.	

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.
A grab groundwater sample was collected prior to abandonment of the borehole.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☒ No ☐
Surface Elevation (feet): 414.378
Northing: 1116965.432
Easting: 953275.696

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-05**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-11-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-11-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 20

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1–4	1.4		ND		(0.0-4.0') SILT; little clay; gravel, fine to medium, subangular; moist; soft to medium stiff; dark brown (10YR 3/2); trace organics (roots)	Backfilled to surface with bentonite pellets
5–7	3.1		ND		(4.0-7.7') CLAY; some silt; trace fine sand; moist; medium stiff to very stiff; brown (7.5YR 4/4).	
8–12	3.4		1.3		(7.7-12.0') SILT and CLAY, non plastic; with interbedded fine sand and gravel, fine, subangular; moist to wet; stiff; brown (7.5YR 4/4).	
13–16	3.0		0.7		(12.0-18.1') SAND, fine; interbedded with silt and clay; wet; soft; dark gray becoming brown (10YR 4/1) to (10YR 4/3); moderate liquefaction.	
17–20	3.4		ND		(18.1-20.0') SAND, fine; some silt; little clay; gravel, fine, subangular to subrounded; moist; stiff; reddish-brown (5YR 4/4). [TILL]	
					End of boring at 20.0' bgs.	

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.
A grab groundwater sample was collected prior to abandonment of the borehole.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☒ No ☐
Surface Elevation (feet): 414.213
Northing: 1116999.545
Easting: 953271.758

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-06**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-11-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-11-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 20

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1–4	2.7		ND		(0.0-0.7') SILT; trace sand, fine; moist; soft; brown (10YR 4/3); little organics (roots). (0.7-2.4') SILT; some clay; little gravel, fine, subangular to subround; moist; stiff; reddish-brown (5YR 4/4). (2.4-9.6') CLAY; some to little silt, non plastic; moist; stiff; dark brown (10YR 3/4).	
5–8	1.3		ND			
9–10	3.7		ND		(9.6-10.7') SILT; some clay with interbedded fine sand seams; moist to wet; stiff; dark brown (10YR 3/4).	Backfilled to surface with bentonite pellets
11–12					(10.7-16.8') SAND, fine; wet; soft; very dark brown to dark brown (10YR 3/2) to (10YR 3/3); interbedded with dark brown (10YR 3/3) silt and very fine sand; moderate liquefaction.	
13–16	3.7	B55-PDI-SB-06 (12-13)	1.8			
17–18	2.8		ND		(16.8-20.0') SILT; some to little sand, fine; little gravel, fine to medium, subangular to subrounded; little to trace clay; moist; stiff; dark yellowish-brown becoming reddish-brown (10YR 4/6)-(5YR 4/4). [TILL]	
19–20					End of boring at 20.0' bgs.	

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 414.242
Northing: 1117002.191
Easting: 953300.164

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-07**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-11-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-11-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 20

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1–4	3.3		ND		(0.0-4.0') SILT; some fine sand; little gravel, fine to medium, subangular; little to trace asphalt; moist; soft to medium stiff; brown (10YR 4/3); organics (roots). [FILL]	Backfilled to surface with bentonite pellets
5–8	1.6		ND		(4.0-8.0') SILT; little sand, fine; clay; trace gravel, fine to medium, subrounded; moist; medium stiff; brown (10YR 4/3).	
8–9					(8.0-8.7') GRAVEL, fine, subangular; wet; loose; very dark gray (10YR 3/1).	
9–12	0.7		ND		(8.7-12.0') No recovery.	
12–16	3.6	B55-PDI-07 (13-14)	7.8		(12.0-17.9') SAND, fine; and SILT, interbedded; wet; soft to slightly stiff; very dark gray to brown, (10YR 3/1) to (10YR 4/3); liquefaction.	
17–20	2.3		ND		(17.9-20.0') SILT; little sand, fine; gravel, fine to medium, subrounded; little to trace clay; moist; stiff; reddish-brown (5Y 4/4). [TILL]	

End of boring at 20.0' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.
A grab groundwater sample was collected prior to abandonment of the borehole.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☒ No ☐
Surface Elevation (feet): 414.116
Northing: 1116981.623
Easting: 953322.250

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-08**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-12-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-12-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 20

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1–4	2.7		ND		(0.0-4.8') SILT; some fine sand; some to little gravel, fine to medium, subangular; trace asphalt, red brick, and organics (roots) ; moist; soft to medium stiff; dark brown (10YR 3/3). [FILL]	Backfilled to surface with bentonite pellets
5–8	2.8		ND		(4.8-8.2') CLAY; some to little silt, non plastic to slight plasticity; interbedded with fine sand; little to trace gravel, fine, subangular; moist; stiff; brown (10YR 4/3).	
9–12	3.9		0.7 1.8		(8.2-16.3') SAND, fine; interbedded silt; wet to saturated; soft to slightly stiff; brown (10YR 4/3).	
13–16	3.4					
17–20	2.7		ND		(16.3-20.0') SAND, fine; some silt; little gravel, fine to medium, subangular; clay; wet becoming to moist; medium stiff becoming very stiff; reddish-brown (5YR 4/4). [TILL]	

End of boring at 20.0' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 414.245
Northing: 1116998.524
Easting: 953253.055

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-09**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-11-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-11-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 4

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1	3.3		ND		(0.0-4.0') SILT; some fine sand; little gravel, fine to medium, subangular; asphalt; moist; soft to medium stiff; brown (10YR 4/3); trace organics (roots). [FILL]	Backfilled to surface with bentonite pellets
2						
3						
4					Unable to advance boring beyond 4.0' bgs. Pulverized concrete in bottom of cutting shoe. Three attempts to offset location; bound by brick wall and edge of sidewalk.	
					End of boring at 4.0' bgs.	

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 413.903
Northing: 1117003.367
Easting: 953331.143

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-10**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-12-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-12-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 18

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1–4	3.8		ND		(0.0-0.9') SILT; some Orgranics, little sand, fine; moist; soft; dark brown (10YR 3/2).	
					(0.9-8.6') SILT; some to little clay; sand, fine; moist becoming dry from 3.5-6.0' bgs; medium stiff to very stiff; dark yellowish-brown (10YR 4/4); trace organics (roots).	
5–8	2.1		50.3			
9–12	3.8	B55-PDI-SB-10 (9-10)	>2,000		(8.6-10.6') SAND, fine; wet; slightly stiff; moderate liquefaction; black (10YR 2/1); degraded petroleum-like odor.	Backfilled to surface with bentonite pellets
					(10.6-12.0') SAND, fine; and interbedded SILT; wet to moist; soft to slightly stiff; dark grayish-brown (10YR 4/2).	
13–16	3.3		8.3		(12.0-16.0') SILT; some to little clay; little fine sand and fine gravel, subangular to subrounded; moist; stiff; reddish-brown (5YR 4/4); with zones of dark grayish-brown (10YR 4/2) fine sand at 12.4 to 12.8 ft and 14.4 to 16.0' bgs.	
17–18	1.5		ND		(16.0-18.0') SILT; some to little clay; little sand, fine; gravel, fine, subangular to subrounded; moist; stiff; reddish-brown (5YR 4/4). [TILL]	

End of boring at 18.0' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 413.679
Northing: 1116960.566
Easting: 953240.575

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-11**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-12-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-12-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 16

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1					(0.0-0.5') SILT; some gravel, fine to medium, subangular; moist; slightly stiff; little organics (roots); very dark grayish-brown (10YR 3/2).	
					(0.5-1.7') GRAVEL, fine to medium, subangular; little silt; fine sand; moist; loose; dark grayish-brown (10YR 4/2).	
2	2.3		ND		(1.7-6.0') CLAY; some to little silt; interbedded with sand, fine; moist; stiff; dark grayish-brown (10YR 4/2), degraded petroleum-like odor.	
3						
4						
5					Black staining at 4.7-4.8', 5.0-5.1', and 5.3-5.6' bgs.	
		B55-PDI-11 (5-6)	404.7			
6	3.3		0.1		(6.0-11.6') SAND, fine; moist to wet; soft to slightly stiff; moderate liquefaction; dark grayish-brown (10YR 4/2).	
			20			
7						
8			10			Backfilled to surface with bentonite pellets
9						
10	3.8					
11						
12					(11.6-13.5') SAND, fine; some silt; little gravel, fine to medium, subangular; wet; soft; dark grayish-brown to brown (10YR 4/2) to (10YR 4/3).	
13						
14	2.7		ND		(13.5-16.0') SILT; some sand, fine; little clay; gravel, fine to medium, subangular; moist; stiff; reddish-brown (5YR 4/4). [TILL]	
15						
16					End of boring at 16.0' bgs.	

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 413.296
Northing: 1116964.764
Easting: 953224.332

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-12**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-12-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-12-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 16

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1					(0.0-0.6') SILT; some sand, fine; moist; soft to medium stiff; dark brown (10YR 3/3); little organics (roots).	
					(0.6-1.8') GRAVEL, fine to medium, subangular; some sand, fine; little silt; moist; loose; dark gray (10YR 4/1).	
2	3.2		ND		(1.8-8.0') SAND, fine; little medium sand; gravel, fine to medium, subangular to subrounded; moist; loose; reddish-brown to dark brown (5YR 4/3) to (10YR 3/3).	
3						
4						
5						
6	1.1		ND			
7						
8						Backfilled to surface with bentonite pellets
9			1.4		(8.0-12.4') SAND, fine; little gravel, fine to medium, angular; very dark grayish-brown to brown (10YR 3/2) to (10YR 4/3); interbedded with brown (10YR 4/3) to yellowish-brown (10YR 4/4) clay and silt.	
10	1.4					
11						
12						
13					(12.4-16.0') SILT; some sand, fine; little clay; gravel, fine to medium, subangular to subrounded; moist; stiff; reddish-brown (5YR 4/4). [TILL]	
14	2.5		ND			
15						
16						

End of boring at 16.0' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 413.365
Northing: 1116985.332
Easting: 953229.118

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-13**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-13-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-13-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 14.5

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
					(0.0-0.6') SILT; some organics (roots); little sand, fine; moist; soft to medium stiff; brown (10YR 4/3).	
1					(0.6-5.7') SAND, fine; some gravel, fine to medium, subangular; little silt; red brick; concrete; moist; loose to medium dense; dark grayish-brown (10YR 4/2). [FILL]	
2	2.5		ND			
3						
4						
5						
6	3.0				(5.7-8.3') SAND, fine; wet; soft; black (10YR 2/1); degraded petroleum-like odor.	
7		B55-PDI-13 (6-8)	>2,000			Backfilled to surface with bentonite pellets
8			838		(8.3-12.5') SAND, fine; and interbedded SILT; trace medium sand; wet; soft to medium stiff; slight liquefaction; dark grayish-brown to brown (10YR 4/2) to (10YR 4/3); faint degraded petroleum-like odor.	
9			142			
10	4.0					
11						
12		B55-PDI-13 (12-12.5)	1.7			
13	2.5		ND		(12.5-14.5') SILT; some sand, fine; little clay; little gravel, fine to medium, subangular to subrounded; moist; stiff; reddish-brown (5YR 4/4). [TILL]	
14						

End of boring at 14.5' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 413.864
Northing: 1116938.111
Easting: 953227.167

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-14**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-13-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-13-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 16

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1	3.6		ND		(0.0-0.6') SILT; some organics (roots); little sand, fine; moist; soft to slighty stiff; brown (10YR 4/3).	Backfilled to surface with bentonite pellets
2					(0.6-3.1') SAND, fine; some gravel, fine to medium, subangular; little silt, red brick, and concrete; moist; loose to medium dense; dark grayish-brown (10YR 4/2). [FILL]	
3						
4					(3.1-8.0') CLAY; some silt, non plastic; moist; stiff; moist to wet; dark brown (10YR 3/3).	
5	2.2		ND			
6						
7						
8						
9	3.3		20.5		(8.0-15.3') SAND, fine; and interbedded SILT; wet; soft to slightly stiff; dark brown (10YR 3/3).	
10						
11						
12						
13	3.4					
14						
15			4.5 ND			
16					(15.3-16.0') SAND, fine; some silt; little clay; gravel, fine, subangular to subrounded; moist; stiff; reddish-brown (5YR 4/4). [TILL]	

End of boring at 16.0' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 414.370
Northing: 1116903.940
Easting: 953261.731

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-15**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-13-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-13-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 19.3

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1	3.8		ND		(0.0-0.4') SILT; some organics; little sand, fine; moist; medium stiff; brown (10YR 4/3). (0.4-1.5') SILT; some gravel, fine to medium, angular to subangular; little sand, fine; trace red brick; moist; soft; dark grayish-brown (10YR 4/2). [FILL]	Backfilled to surface with bentonite pellets
2					(1.5-2.0') Pulverized ROCK.	
3					(2.0-3.6') SILT; some clay; little gravel, fine to medium, subangular; trace sand, fine; moist; stiff; reddish-brown (5YR 4/4).	
4						
5	3.4		ND		(3.6-8.5') CLAY; some to little silt, non plastic; moist; medium stiff to very stiff; dark grayish-brown to grayish-brown (10YR 4/2) to (10YR 5/2).	
6						
7						
8						
9	3.1	B55-PDI-SB-15 (8-9)	199.8 36.3		(8.5-12.0') SAND, fine; and interbedded SILT; wet; soft to slighlty stiff; slight liquefaction; yellowish-brown to dark yellowish-brown (10YR 5/4) to (10YR 4/6). Zones of (10YR 2/1) black staining at 8.6-9.1' bgs; faint degraded petroleum-like odor in stained seams.	
10						
11			10.2			
12	3.8		ND		(12.0-17.6') SAND, fine; trace gravel, fine, subangular; wet; soft to slightly stiff; brown (10YR 4/3).	
13						
14						
15						
16						
17	3.3		ND		(17.6-19.3') SILT; some clay; little gravel, fine to medium, subangular to subrounded; fine sand; moist; stiff; dark reddish-brown (5YR 4/4). [TILL]	
18						
19						

End of boring at 19.3' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.
A grab groundwater sample was collected prior to abandonment of the borehole.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☒ No ☐
Surface Elevation (feet): 414.595
Northing: 1116882.153
Easting: 953287.007

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-16**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-13-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-13-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 15

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1	2.6		ND		(0.0-0.8') SILT; some fine sand and organics (roots); moist; soft to slightly stiff; dark brown (10YR 3/3).	Backfilled to surface with bentonite pellets
2					(0.8-2.2') GRAVEL, fine to medium, angular to subangular; sand, fine; moist; loose to medium dense; dark grayish-brown (10YR 4/2). [FILL]	
3					(2.2-5.6') SILT; some clay, non plastic; moist; slightly stiff to medium stiff; brown (10YR 4/3).	
4						
5						
6	2.7		ND		(5.6-8.6') SAND, fine and interbedded SILT; wet to saturated; soft to slightly stiff; moderate liquefaction; brown (10YR 4/3).	
7						
8						
9	3.5		0.8		(8.6-13.1') SAND, fine; wet; soft to slightly stiff; slight liquefaction; brown (10YR 4/3). [TILL]	
10						
11						
12						
13	2.3		ND		(13.1-15.0') SILT; some clay; little sand, fine; gravel, fine to medium, subangular to subrounded; moist; stiff; reddish-brown (5YR 4/4). [TILL]	
14						
15						

End of boring at 15.0' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.
A grab groundwater sample was collected prior to abandonment of the borehole.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☒ No ☐
Surface Elevation (feet): 413.962
Northing: 1116899.683
Easting: 953231.258

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-17**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-16-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-16-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 16

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1	3.2		ND		(0.0-0.7') SILT; some to little sand, fine; some organics (roots); moist; soft to slightly stiff; dark brown (10YR 3/3). (0.7-8.0') SILT; some sand, fine; gravel, fine to medium, angular to subangular; little red brick and concrete; moist; soft; brown to dark grayish-brown (10YR 4/3). [FILL]	Backfilled to surface with bentonite pellets
2						
3						
4						
5	2.3		ND			
6						
7						
8		B55-PDI-SB-17 (8-9)	304.7		(8.0-14.1') SAND, fine; very dark grayish-brown (10YR 3/1); wet; soft to slightly stiff; moderate liquefaction; staining at 8.2 to 8.6' bgs; degraded petroleum-like odor. SILT seam 8.6 to 8.9' bgs (below staining).	
9		B55-PDI-SB-17 (9-10)				
10						
11			42.2			
12						
13	3.0		ND		(14.1-16.0') SILT; some sand, fine; little gravel, fine to medium, subangular to subrounded; clay; moist; stiff; reddish-brown (5YR 4/4). [TILL]	
14						
15						
16						

End of boring at 16.0' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 414.320
Northing: 1116917.857
Easting: 953247.644

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-18**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-16-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-16-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 22.5

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1	3.6		ND		(0.0-0.6') ASPHALT. (0.6-1.6') GRAVEL, medium to fine, angular; moist; loose; dark gray (10YR 4/1). (1.6-2.2') SAND, fine; little silt; moist; soft to slightly stiff; yellowish-brown to dark gray (10YR 5/4) to (10YR 4/1). (2.2-3.1') SILT; some sand, fine; little gravel, fine to medium, subangular; trace clay; moist; stiff; reddish-brown (5YR 4/4). (3.1-8.5') SILT; some clay, non plastic; moist; medium stiff; very dark gray (10YR 3/1); transitioning to dark brown (10YR 3/3).	
2						
3						
4						
5	3.1		ND			
6						
7						
8						
9	3.9	B55-PDI-SB-18 (9.5-10.5 B55-PDI-SB-18 (10.7-11.7)	156.6		(8.5-12.0') SAND, fine; moist to wet; soft to slightly stiff; dark grayish-brown (10YR 4/2). SILT seam at 10.5 to 10.7' bgs; staining from 9.9-10.5' bgs; black (10YR 2/1); degraded petroleum-like odor.	Backfilled to surface with bentonite pellets
10						
11						
12						
13	3.9		2.0		(12.0-20.1') SAND, fine and interbedded SILT; saturated to wet; soft to slightly stiff; moderate liquefaction; brown (10YR 4/3).	
14						
15						
16						
17	3.9		ND			
18						
19						
20						
21	2.5		ND		(20.1-22.5') SILT; some sand, fine; little gravel, fine to medium, subangular to subround; clay; moist; stiff; reddish-brown (5YR 4/4). [TILL]	
22					End of boring at 22.5' bgs.	

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.
A grab groundwater sample was collected prior to abandonment of the borehole.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☒ No ☐
Surface Elevation (feet): 413.630
Northing: 1116901.866
Easting: 953325.182

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-19**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-16-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-16-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 20

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1	3.9		ND		(0.0-0.6') ASPHALT.	Backfilled to surface with bentonite pellets
					(0.6-1.5') GRAVEL, fine to medium, angular; some to little sand, fine; little silt; moist; loose; dark gray (10YR 4/1).	
2					(1.5-2.7') SILT; some sand, fine; little gravel, fine to medium, subangular; little to trace clay; moist; stiff; reddish-brown (5YR 4/4).	
3					(2.7-4.8') SILT; little to some clay, non plastic; moist; medium stiff; dark grayish-brown (10YR 4/2); trace organics (roots, root hairs). Transition to CLAY at 4.8' bgs.	
4						
5	2.7		ND		(4.8-8.1') CLAY; some to little silt at 4.8' bgs.	
6						
7						
8						
9	3.4				(8.1-11.6') SILT and interbedded SAND, fine; wet to saturated; slightly stiff; slight liquefaction; brown (7.5YR 4/4).	
10						
11						
12		B55-PDI-SB-19 (11.6-12.6)	8.8		(11.6-12.0') SAND, fine; wet; soft to slightly stiff; dark grayish-brown (10YR 4/2).	
13	3.9		1.5		(12.0-16.6') SAND, fine; and interbedded SILT; wet; soft to slightly stiff; moderate to slight liquefaction; dark grayish-brown to brown (10YR 4/2) to (10YR 4/3).	
14						
15						
16						
17	3.6		ND		(16.6-20.0') SILT and SAND, fine; little gravel, fine to medium, subangular to subround; little to trace clay; medium stiff; reddish-brown (5YR 4/4). [TILL]	
18						
19						
20						

End of boring at 20.0' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 412.677
Northing: 1116924.246
Easting: 953370.615

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-20**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-16-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-16-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 14

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
1					(0.0-0.8') ASPHALT.	
2	2.9		ND		(0.8-14.0') SILT; some sand, fine; gravel, fine to medium, angular; moist; soft to medium stiff; dark grayish-brown (10YR 4/2); trace organics (roots, root hairs), red brick, and plastic sheeting. [FILL]	
3						
4						
5						
6	3.1		ND			Backfilled to surface with bentonite pellets
7						
8						
9						
10	2.9		ND			
11						
12						
13	2.0		ND			
14					Refusal encountered at 14.0' bgs. Concrete in bottom of cutting shoe. Moved 3' to the south, blind drilled to 14.0' bgs, and resumed sampling. Unable to advance beyond 14.0' bgs. End of boring.	

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 412.863
Northing: 1116963.762
Easting: 953364.402

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-21**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-17-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-17-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 14

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
0					(0.0-0.8') ASPHALT.	
1					(0.8-1.9') SAND, fine; and GRAVEL, fine to medium, subangular; some to little silt; moist; loose; dark grayish-brown (10YR 4/2).	
2	2.4		ND		(1.9-4.4') CLAY; some silt, non plastic; moist; medium stiff; brown (10YR 4/3).	
3						
4						
5		B55-PDI-SB-21 (4.5-5.5)	5.8		(4.4-12.9') SAND, fine; little to trace gravel, fine, subangular; moist becoming wet; loose; dark grayish-brown (10YR 4/2).	
6	3.2					
7					SILT seam from 7.2-7.6' bgs.	Backfilled to surface with bentonite pellets
8						
9			1.6			
10	3.4		ND			
11						
12						
13	1.7		ND		(12.9-14.0') SILT; some clay; little gravel, fine to medium, subangular; moist; stiff; reddish-brown (5YR 4/4). [TILL]	
14					End of boring at 14.0' bgs.	

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.
A grab groundwater sample was collected prior to abandonment of the borehole.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☒ No ☐
Surface Elevation (feet): 413.180
Northing: 1116937.480
Easting: 953214.788

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

ARCADIS

Soil Boring Log

Boring No.: **B55-PDI-SB-22**

Sheet: 1 of 1

Project Name: Building 55 Area IRM WP
Date Started: 11-17-2020
Logger: Josh Miller

Project Number: 30049894
Date Completed: 11-17-2020
Editor: Nathan Smith

Project Location: Bristol-Myers Squibb, Burnet Avenue, East Syracuse, NY
Borehole Depth (feet bgs): 15.2

Depth (feet)	Recovery (feet)	Analytical Sample ID	PID (ppm)	Geologic Column	Description	Construction Details
0					(0.0-0.6') ASPHALT.	
1					(0.6-1.8') GRAVEL, fine to medium, subangular; some silt; sand, fine; moist; loose; dark grayish-brown (10YR 4/2).	
2	2.3		ND		(1.8-5.4') CLAY; some silt, non plastic; moist; medium stiff; brown (10YR 4/3).	
3						
4						
5			24.3			
6	3.7	B55-PDI-SB-22 (5.2-6.2)			(5.4-12.9') SAND, fine; and interbedded SILT; wet to saturated; soft to slightly stiff; moderate liquefaction; dark brown to dark grayish-brown (10YR 3/3 to 10YR 4/2).	Backfilled to surface with bentonite pellets
7						
8						
9						
10	3.6		ND			
11						
12						
13					(12.9-15.2') SILT; some to little clay; little sand, fine; gravel, fine to medium, subangular; moist; stiff; reddish-brown (5YR 4/4). [TILL]	
14	3.2		ND			
15						

End of boring at 15.2' bgs.

Drilling Company: Arcadis of NY
Driller: Doug Richmond
Drilling Method: Direct Push
Drill Rig: AMS 9520 VTR Power Probe
Remarks: bgs = below ground surface; ppm = parts per million;
PID = photo ionization detector; NA = not applicable / available; ND = not detected.
Horizontal survey coordinate system = NAD 83. Vertical coordinate system = NAVD 88.

Sampling Method: 2"x4' Liner
Sampling Interval: Continuous
Water Level Start (' bgs): NA
Water Level Finish (' btoc): NA
Grab Groundwater Sample: Yes ☐ No ☒
Surface Elevation (feet): 412.950
Northing: 1116958.061
Easting: 953213.217

BRISTOL MYERS SQUIBB C:\USERS\NPSMITH\ONEDRIVE - ARCADIS_BORING LOGS\BM-SQUIBB\2020 LOGS\BLDG 55 PDI_GINT FILES\BRISTOL MYERS SQUIBB-PROJECT FILE.GPJ 260053.GDT 1/29/21

APPENDIX B

Laboratory Analytical Reports and Data Validation Summary Reports

Laboratory Analytical Reports

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-20273-1
Client Project/Site: Bristol-Myers Squibb
Revision: 1

For:
ARCADIS U.S. Inc
One Lincoln Center
110 West Fayette St, Suite 300
Syracuse, New York 13202

Attn: William T McCune

Authorized for release by:
12/30/2020 4:51:32 PM

Megan Moeller, Client Services Group Leader
(717)556-7261
Megan.Moeller@eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

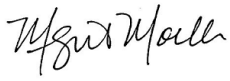
Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



Megan Moeller
Client Services Group Leader
12/30/2020 4:51:33 PM

Table of Contents

Cover Page 1
Table of Contents 3
Definitions/Glossary 4
Case Narrative 6
Detection Summary 8
Client Sample Results 10
Surrogate Summary 24
QC Sample Results 26
QC Association Summary 43
Lab Chronicle 45
Certification Summary 47
Method Summary 48
Sample Summary 49
Chain of Custody 50
Receipt Checklists 51

Definitions/Glossary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*1	LCS/LCSD RPD exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-20273-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-20273-1

Revision
The report being provided is a revision of the original report sent on 12/7/2020. The report (revision 1) is being revised due to: Add 1,4-Dioxane.

Receipt
The samples were received on 11/11/2020 11:00 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.2º C.

GC/MS VOA
Method 8260C: The continuing calibration verification (CCV) associated with batch 410-69161 recovered outside acceptance criteria, low biased, for 2-Butanone and Chloromethane. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: The continuing calibration verification (CCV) associated with batch 410-69161 recovered above the upper control limit for 2-Nitropropane and Bromoform. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: Surrogate recovery for the following sample was outside control limits: B55-PDI-SB-02 (10-12) (410-20273-3). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method 8260C: The continuing calibration verification (CCV) associated with batch 410-69809 recovered above the upper control limit for 1,4-Dioxane. Non-detections of the affected analytes are reported. Any detections are considered estimated.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270D: A surrogate recovery for the method blank (MB) associated with preparation batch 410-66233 was outside the upper control limits. The MB did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method 8270D: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 410-66233 recovered outside control limits for the following analytes: Triethylamine. The stated control limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

HPLC/IC
Method 8315A: Surrogate recovery for the following sample was outside control limits: B55-PDI-SB-01 (16-16.9) (410-20273-2). Re-extraction and/or re-analysis was performed out of holding time and surrogate recovery was outside control limits. Data was reported in original batch.

Method 8315A: The following samples were prepared within holding time but analyzed outside of analytical holding time :B55-PDI-SB-01 (8-10) (410-20273-1), B55-PDI-SB-01 (16-16.9) (410-20273-2) and B55-PDI-SB-02 (10-12) (410-20273-3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
Method 5035: The following samples were preserved via freezing on November 11, 2020 at 22:02: B55-PDI-SB-01 (8-10) (410-20273-1), B55-PDI-SB-01 (16-16.9) (410-20273-2) and B55-PDI-SB-02 (10-12) (410-20273-3) . This is within the 48 hour time frame required by the method.

Job ID: 410-20273-1 (Continued)

Laboratory: Eurofins Lancaster Laboratories Env, LLC (Conti

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Client Sample ID: B55-PDI-SB-01 (8-10) — Lab Sample ID: 410-20273-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	17		1.1	0.089	mg/Kg	200	☼	8260C	Total/NA
Cyclohexane	37		1.1	0.11	mg/Kg	200	☼	8260C	Total/NA
m&p-Xylene	40		1.1	0.22	mg/Kg	200	☼	8260C	Total/NA
1,3,5-Trimethylbenzene	55		1.1	0.11	mg/Kg	200	☼	8260C	Total/NA
o-Xylene	9.3		1.1	0.089	mg/Kg	200	☼	8260C	Total/NA
Isopropylbenzene	10		1.1	0.089	mg/Kg	200	☼	8260C	Total/NA
Naphthalene	13		1.1	0.44	mg/Kg	200	☼	8260C	Total/NA
n-Butylbenzene	11		1.8	0.67	mg/Kg	200	☼	8260C	Total/NA
p-Isopropyltoluene	2.2		1.1	0.44	mg/Kg	200	☼	8260C	Total/NA
sec-Butylbenzene	3.3		1.1	0.44	mg/Kg	200	☼	8260C	Total/NA
Xylenes, Total	49		2.2	0.31	mg/Kg	200	☼	8260C	Total/NA
Methylcyclohexane - DL	83		11	1.3	mg/Kg	2000	☼	8260C	Total/NA
1,2,4-Trimethylbenzene - DL	240		11	1.1	mg/Kg	2000	☼	8260C	Total/NA
n-Heptane - DL	110		18	6.7	mg/Kg	2000	☼	8260C	Total/NA
1,1'-Biphenyl	0.072		0.043	0.020	mg/Kg	1	☼	8270D	Total/NA
Fluoranthene	0.0069	J	0.020	0.0039	mg/Kg	1	☼	8270D	Total/NA
Fluorene	0.033		0.020	0.0039	mg/Kg	1	☼	8270D	Total/NA
Naphthalene	2.9		0.020	0.0079	mg/Kg	1	☼	8270D	Total/NA
Phenanthrene	0.059		0.020	0.0039	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.011	J	0.020	0.0039	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine	1.5	J	2.4	0.79	mg/Kg	1	☼	8270D	Total/NA
2-Methylnaphthalene - DL	6.4		0.20	0.020	mg/Kg	5	☼	8270D	Total/NA
Formaldehyde	170		89	30	ug/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-SB-01 (16-16.9) — Lab Sample ID: 410-20273-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	0.0076		0.0041	0.00041	mg/Kg	1	☼	8260C	Total/NA
1,3,5-Trimethylbenzene	0.0022	J	0.0041	0.00041	mg/Kg	1	☼	8260C	Total/NA
Acetone	0.038		0.016	0.0049	mg/Kg	1	☼	8260C	Total/NA
Cyclohexane	0.0056		0.0041	0.00041	mg/Kg	1	☼	8260C	Total/NA
Ethylbenzene	0.00053	J	0.0041	0.00033	mg/Kg	1	☼	8260C	Total/NA
Isopropylbenzene	0.00033	J	0.0041	0.00033	mg/Kg	1	☼	8260C	Total/NA
m&p-Xylene	0.0015	J	0.0041	0.00082	mg/Kg	1	☼	8260C	Total/NA
Methylcyclohexane	0.0029	J	0.0041	0.00049	mg/Kg	1	☼	8260C	Total/NA
o-Xylene	0.00036	J	0.0041	0.00033	mg/Kg	1	☼	8260C	Total/NA
Xylenes, Total	0.0019	J	0.0082	0.0011	mg/Kg	1	☼	8260C	Total/NA
2-Methylnaphthalene	0.013	J	0.038	0.0038	mg/Kg	1	☼	8270D	Total/NA
Naphthalene	0.033		0.019	0.0075	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	4.9		4.5	1.5	mg/Kg	2	☼	8270D	Total/NA
Formaldehyde	100		85	28	ug/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-SB-02 (10-12) — Lab Sample ID: 410-20273-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.35		0.32	0.025	mg/Kg	50	☼	8260C	Total/NA
Methylcyclohexane	2.3		0.32	0.038	mg/Kg	50	☼	8260C	Total/NA
m&p-Xylene	1.3		0.32	0.064	mg/Kg	50	☼	8260C	Total/NA
1,3,5-Trimethylbenzene	8.2		0.32	0.032	mg/Kg	50	☼	8260C	Total/NA
o-Xylene	0.22	J	0.32	0.025	mg/Kg	50	☼	8260C	Total/NA
Isopropylbenzene	1.4		0.32	0.025	mg/Kg	50	☼	8260C	Total/NA
Naphthalene	0.57		0.32	0.13	mg/Kg	50	☼	8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: B55-PDI-SB-02 (10-12) (Continued)
Lab Sample ID: 410-20273-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
n-Butylbenzene	2.5		0.51	0.19	mg/Kg	50	☼	8260C	Total/NA
n-Heptane	0.78		0.51	0.19	mg/Kg	50	☼	8260C	Total/NA
p-Isopropyltoluene	0.47		0.32	0.13	mg/Kg	50	☼	8260C	Total/NA
sec-Butylbenzene	0.75		0.32	0.13	mg/Kg	50	☼	8260C	Total/NA
Xylenes, Total	1.5		0.64	0.089	mg/Kg	50	☼	8260C	Total/NA
1,2,4-Trimethylbenzene - DL	34		3.2	0.32	mg/Kg	500	☼	8260C	Total/NA
2-Methylnaphthalene	0.41		0.039	0.0039	mg/Kg	1	☼	8270D	Total/NA
Naphthalene	0.060		0.019	0.0077	mg/Kg	1	☼	8270D	Total/NA
Phenanthrene	0.014	J	0.019	0.0039	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	8.6		6.9	2.3	mg/Kg	3	☼	8270D	Total/NA
Formaldehyde	81	J	88	29	ug/Kg	1	☼	8315A	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Client Sample ID: B55-PDI-SB-01 (8-10)
Date Collected: 11/10/20 10:35
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-1
Matrix: Soil
Percent Solids: 84.3

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
trans-1,3-Dichloropropene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Ethylbenzene	**17**		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Styrene	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,4-Dichlorobenzene	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2-Dibromoethane	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2-Dichloroethane	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
4-Methyl-2-pentanone	ND		2.2	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Toluene	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Chlorobenzene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Cyclohexane	**37**		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2,4-Trichlorobenzene	ND		2.2	1.1	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,4-Dioxane	ND		56	8.2	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Dibromochloromethane	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Tetrachloroethene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
cis-1,2-Dichloroethene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
trans-1,2-Dichloroethene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Methyl tertiary butyl ether	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
m&p-Xylene	**40**		1.1	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,3,5-Trimethylbenzene	**55**		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,3-Dichlorobenzene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Carbon tetrachloride	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
2-Hexanone	ND		2.2	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Acetone	ND		4.4	1.3	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Chloroform	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Benzene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,1,1-Trichloroethane	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Bromomethane	ND		1.1	0.16	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Chloromethane	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Bromochloromethane	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Chloroethane	ND		1.1	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Vinyl chloride	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Methylene Chloride	ND		1.1	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Carbon disulfide	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Bromoform	ND	*	2.2	1.1	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Bromodichloromethane	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,1-Dichloroethane	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,1-Dichloroethene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Trichlorofluoromethane	ND		1.1	0.16	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Dichlorodifluoromethane	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Freon 113	ND		2.2	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2-Dichloropropane	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
2-Butanone	ND		2.2	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,1,2-Trichloroethane	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
2-Nitropropane	ND	*	2.2	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Trichloroethene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Methyl acetate	ND		1.1	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,1,2,2-Tetrachloroethane	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2,3-Trichlorobenzene	ND		2.2	1.1	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200

Client Sample ID: B55-PDI-SB-01 (8-10)

Date Collected: 11/10/20 10:35
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-1

Matrix: Soil
Percent Solids: 84.3

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	**9.3**		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2-Dichlorobenzene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2-Dibromo-3-Chloropropane	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Acetonitrile	ND		22	5.6	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Isopropylbenzene	**10**		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Chlorodifluoromethane	ND		2.2	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Cyclohexanone	ND		56	5.6	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Ethyl acetate	ND		1.1	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Ethyl ether	ND		1.1	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Isobutyl alcohol	ND		56	8.4	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Naphthalene	**13**		1.1	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
n-Butanol	ND		56	12	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
n-Butylbenzene	**11**		1.8	0.67	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
p-Isopropyltoluene	**2.2**		1.1	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
sec-Butylbenzene	**3.3**		1.1	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
t-Butyl alcohol	ND		22	3.3	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
tert-Butylbenzene	ND		1.1	0.18	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Tetrahydrofuran	ND		1.8	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Xylenes, Total	**49**		2.2	0.31	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Hexane, 3-methyl-	*26*	*T J N*	*mg/Kg*	☼	*7.31*	*589-34-4*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Heptane, 2-methyl-	*34*	*T J N*	*mg/Kg*	☼	*9.47*	*592-27-8*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Heptane, 3-methyl-	*28*	*T J N*	*mg/Kg*	☼	*9.64*	*589-81-1*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Octane	*30*	*T J N*	*mg/Kg*	☼	*10.12*	*111-65-9*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Unknown	*31*	*T J*	*mg/Kg*	☼	*11.12*		*11/12/20 22:07*	*11/23/20 01:19*	*200*
Benzene, 1-ethyl-3-methyl-	*77*	*T J N*	*mg/Kg*	☼	*12.56*	*620-14-4*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Benzene, 1-ethyl-4-methyl-	*36*	*T J N*	*mg/Kg*	☼	*12.60*	*622-96-8*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Benzene, 1-ethyl-2-methyl-	*34*	*T J N*	*mg/Kg*	☼	*12.78*	*611-14-3*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Unknown	*34*	*T J*	*mg/Kg*	☼	*13.37*		*11/12/20 22:07*	*11/23/20 01:19*	*200*
Benzene, 2-ethenyl-1,4-dimethyl-	*31*	*T J N*	*mg/Kg*	☼	*14.30*	*2039-89-6*	*11/12/20 22:07*	*11/23/20 01:19*	*200*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
4-Bromofluorobenzene (Surr)	*126*		*50 - 131*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Dibromofluoromethane (Surr)	*98*		*50 - 141*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Toluene-d8 (Surr)	*126*		*52 - 141*	*11/12/20 22:07*	*11/23/20 01:19*	*200*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	**83**		11	1.3	mg/Kg	☼	11/12/20 22:07	11/23/20 01:40	2000
1,2,4-Trimethylbenzene	**240**		11	1.1	mg/Kg	☼	11/12/20 22:07	11/23/20 01:40	2000
n-Heptane	**110**		18	6.7	mg/Kg	☼	11/12/20 22:07	11/23/20 01:40	2000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*54 - 135*	*11/12/20 22:07*	*11/23/20 01:40*	*2000*
4-Bromofluorobenzene (Surr)	*130*		*50 - 131*	*11/12/20 22:07*	*11/23/20 01:40*	*2000*
Dibromofluoromethane (Surr)	*96*		*50 - 141*	*11/12/20 22:07*	*11/23/20 01:40*	*2000*
Toluene-d8 (Surr)	*120*		*52 - 141*	*11/12/20 22:07*	*11/23/20 01:40*	*2000*

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Client Sample ID: B55-PDI-SB-01 (8-10)
Date Collected: 11/10/20 10:35
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-1
Matrix: Soil
Percent Solids: 84.3

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	0.072		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
1,2,4,5-Tetrachlorobenzene	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,2'-oxybis[1-chloropropane]	ND		0.051	0.024	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4,5-Trichlorophenol	ND		0.079	0.035	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4,6-Trichlorophenol	ND		0.067	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4-Dichlorophenol	ND		0.051	0.024	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4-Dimethylphenol	ND		0.079	0.035	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4-Dinitrophenol	ND		1.2	0.39	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4-Dinitrotoluene	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,6-Dinitrotoluene	ND		0.059	0.028	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2-Chloronaphthalene	ND		0.039	0.0079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2-Chlorophenol	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2-Methylphenol	ND		0.079	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2-Nitroaniline	ND		0.059	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2-Nitrophenol	ND		0.067	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
3,3'-Dichlorobenzidine	ND		0.39	0.12	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
3-Nitroaniline	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4,6-Dinitro-2-methylphenol	ND		0.59	0.28	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Bromophenyl-phenylether	ND		0.059	0.028	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Chloro-3-methylphenol	ND		0.059	0.028	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
3,4-Methylphenol	ND		0.059	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Nitroaniline	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Nitrophenol	ND		0.59	0.20	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Acenaphthene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Acenaphthylene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Acetophenone	ND		0.059	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Anthracene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Atrazine	ND		0.51	0.24	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzaldehyde	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzo[a]anthracene	ND		0.020	0.0079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzo[a]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzo[b]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzo[g,h,i]perylene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzo[k]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Bis(2-chloroethoxy)methane	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Bis(2-chloroethyl)ether	ND		0.059	0.028	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Butylbenzylphthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Caprolactam	ND		0.20	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Carbazole	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Chrysene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Di-n-butyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Di-n-octyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Dibenz(a,h)anthracene	ND		0.020	0.0079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Dibenzofuran	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Diethyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Dimethyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Fluoranthene	0.0069	J	0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1

Client Sample ID: B55-PDI-SB-01 (8-10)

Date Collected: 11/10/20 10:35
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-1

Matrix: Soil
Percent Solids: 84.3

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloroaniline	ND		0.20	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Fluorene	**0.033**		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Chlorophenyl-phenyl ether	ND		0.051	0.024	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Hexachlorobenzene	ND		0.020	0.0079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Hexachlorobutadiene	ND		0.090	0.043	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Hexachlorocyclopentadiene	ND		0.59	0.24	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Hexachloroethane	ND		0.20	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Isophorone	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
N-Nitrosodi-n-propylamine	ND		0.059	0.028	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
N-Nitrosodiphenylamine	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Naphthalene	**2.9**		0.020	0.0079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Nitrobenzene	ND		0.079	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Phenanthrene	**0.059**		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Aniline	ND		0.59	0.20	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Phenol	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Pyrene	**0.011**	**J**	0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Pentachlorophenol	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzyl alcohol	ND		0.59	0.20	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Dicyclohexylamine	**1.5**	**J**	2.4	0.79	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
n,n'-Dimethylaniline	ND		0.20	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Pyridine	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Triethylamine	ND	*- *1	5.9	2.0	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
1,4-Dioxane	ND		0.39	0.12	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*76*	*T J*	*mg/Kg*	☼	*3.46*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*12*	*T J*	*mg/Kg*	☼	*3.50*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*42*	*T J*	*mg/Kg*	☼	*3.58*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*50*	*T J*	*mg/Kg*	☼	*4.03*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1-ethyl-4-methyl-	*9.4*	*T J N*	*mg/Kg*	☼	*5.11*	*622-96-8*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1-ethyl-3-methyl-	*5.1*	*T J N*	*mg/Kg*	☼	*5.14*	*620-14-4*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1,2,3-trimethyl-	*4.8*	*T J N*	*mg/Kg*	☼	*5.18*	*526-73-8*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1-ethyl-2-methyl-	*3.5*	*T J N*	*mg/Kg*	☼	*5.25*	*611-14-3*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*18*	*T J*	*mg/Kg*	☼	*5.40*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1,3,5-trimethyl-	*5.4*	*T J N*	*mg/Kg*	☼	*5.61*	*108-67-8*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1-methyl-3-propyl-	*4.3*	*T J N*	*mg/Kg*	☼	*5.83*	*1074-43-7*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1,4-diethyl-	*8.2*	*T J N*	*mg/Kg*	☼	*5.87*	*105-05-5*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Indan, 1-methyl-	*3.4*	*T J N*	*mg/Kg*	☼	*6.10*	*767-58-8*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
1,2,4-Trithiolane	*7.5*	*T J N*	*mg/Kg*	☼	*6.22*	*289-16-7*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1,2,3,5-tetramethyl-	*3.3*	*T J N*	*mg/Kg*	☼	*6.30*	*527-53-7*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1,2,4,5-tetramethyl-	*5.4*	*T J N*	*mg/Kg*	☼	*6.33*	*95-93-2*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
1H-Indene, 2,3-dihydro-4-methyl-	*4.9*	*T J N*	*mg/Kg*	☼	*6.47*	*824-22-6*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
2,4-Dimethylstyrene	*11*	*T J N*	*mg/Kg*	☼	*6.53*	*2234-20-0*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*3.7*	*T J*	*mg/Kg*	☼	*6.58*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*3.3*	*T J*	*mg/Kg*	☼	*6.63*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*6.3*	*T J*	*mg/Kg*	☼	*6.81*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
1H-Indene, 2,3-dihydro-4,7-dimethyl-	*3.1*	*T J N*	*mg/Kg*	☼	*7.17*	*6682-71-9*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*2.9*	*T J*	*mg/Kg*	☼	*7.24*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Tridecane	*3.5*	*T J N*	*mg/Kg*	☼	*7.40*	*629-50-5*	*11/16/20 00:40*	*11/24/20 13:49*	*1*

Client Sample ID: B55-PDI-SB-01 (8-10)

Date Collected: 11/10/20 10:35
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-1
Matrix: Soil
Percent Solids: 84.3

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Naphthalene, 1-methyl-	3.5	T J N	mg/Kg	☼	7.57	90-12-0	11/16/20 00:40	11/24/20 13:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	93		45 - 108	11/16/20 00:40	11/24/20 13:49	1
Nitrobenzene-d5 (Surr)	59		32 - 97	11/16/20 00:40	11/24/20 13:49	1
2-Fluorophenol (Surr)	76		26 - 96	11/16/20 00:40	11/24/20 13:49	1
2-Fluorobiphenyl (Surr)	85		39 - 100	11/16/20 00:40	11/24/20 13:49	1
2,4,6-Tribromophenol (Surr)	19		13 - 121	11/16/20 00:40	11/24/20 13:49	1
Phenol-d5 (Surr)	81		27 - 104	11/16/20 00:40	11/24/20 13:49	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	**6.4**		0.20	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 17:22	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	84		45 - 108	11/16/20 00:40	11/24/20 17:22	5
Nitrobenzene-d5 (Surr)	64		32 - 97	11/16/20 00:40	11/24/20 17:22	5
2-Fluorophenol (Surr)	76		26 - 96	11/16/20 00:40	11/24/20 17:22	5
2-Fluorobiphenyl (Surr)	74		39 - 100	11/16/20 00:40	11/24/20 17:22	5
2,4,6-Tribromophenol (Surr)	16		13 - 121	11/16/20 00:40	11/24/20 17:22	5
Phenol-d5 (Surr)	79		27 - 104	11/16/20 00:40	11/24/20 17:22	5

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	F1	59	30	ug/Kg	☼	11/14/20 08:33	11/18/20 21:44	1
Formaldehyde	**170**		89	30	ug/Kg	☼	11/14/20 08:33	11/18/20 21:44	1
Glutaraldehyde	ND		59	30	ug/Kg	☼	11/14/20 08:33	11/18/20 21:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	133		77 - 133	11/14/20 08:33	11/18/20 21:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**15.7**		1.0	1.0	%			11/12/20 21:26	1

Client Sample ID: B55-PDI-SB-01 (16-16.9)

Date Collected: 11/10/20 10:30
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-2
Matrix: Soil
Percent Solids: 87.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,1,2,2-Tetrachloroethane	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,1,2-Trichloroethane	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,1-Dichloroethane	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,1-Dichloroethene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2,3-Trichlorobenzene	ND		0.0082	0.0041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2,4-Trichlorobenzene	ND		0.0082	0.0041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2,4-Trimethylbenzene	**0.0076**		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2-Dibromo-3-Chloropropane	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2-Dibromoethane	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1

Client Sample ID: B55-PDI-SB-01 (16-16.9)
Date Collected: 11/10/20 10:30
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-2
Matrix: Soil
Percent Solids: 87.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2-Dichloroethane	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2-Dichloropropane	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,3,5-Trimethylbenzene	**0.0022**	**J**	0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,3-Dichlorobenzene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,4-Dichlorobenzene	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,4-Dioxane	ND		0.20	0.030	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
2-Butanone	ND		0.0082	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
2-Hexanone	ND		0.0082	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
2-Nitropropane	ND		0.0082	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
4-Methyl-2-pentanone	ND		0.0082	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Acetone	**0.038**		0.016	0.0049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Acetonitrile	ND		0.082	0.020	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Benzene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Bromochloromethane	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Bromodichloromethane	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Bromoform	ND		0.0082	0.0041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Bromomethane	ND		0.0041	0.00057	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Carbon disulfide	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Carbon tetrachloride	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Chlorobenzene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Chlorodifluoromethane	ND		0.0082	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Chloroethane	ND		0.0041	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Chloroform	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Chloromethane	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
cis-1,2-Dichloroethene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
cis-1,3-Dichloropropene	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Cyclohexane	**0.0056**		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Cyclohexanone	ND		0.20	0.020	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Dibromochloromethane	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Dichlorodifluoromethane	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Ethyl acetate	ND		0.0041	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Ethyl ether	ND		0.0041	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Ethylbenzene	**0.00053**	**J**	0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Freon 113	ND		0.0082	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Isobutyl alcohol	ND		0.20	0.031	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Isopropylbenzene	**0.00033**	**J**	0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
m&p-Xylene	**0.0015**	**J**	0.0041	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Methyl acetate	ND		0.0041	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Methyl tertiary butyl ether	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Methylcyclohexane	**0.0029**	**J**	0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Methylene Chloride	ND		0.0041	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Naphthalene	ND		0.0041	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
n-Butanol	ND		0.20	0.046	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
n-Butylbenzene	ND		0.0065	0.0024	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
n-Heptane	ND		0.0065	0.0024	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
o-Xylene	**0.00036**	**J**	0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
p-Isopropyltoluene	ND		0.0041	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
sec-Butylbenzene	ND		0.0041	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1

Client Sample ID: B55-PDI-SB-01 (16-16.9)

Date Collected: 11/10/20 10:30
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-2

Matrix: Soil
Percent Solids: 87.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
t-Butyl alcohol	ND		0.082	0.012	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
tert-Butylbenzene	ND		0.0041	0.00065	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Tetrachloroethene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Tetrahydrofuran	ND		0.0065	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Toluene	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
trans-1,2-Dichloroethene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
trans-1,3-Dichloropropene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Trichloroethene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Trichlorofluoromethane	ND		0.0041	0.00057	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Vinyl chloride	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Xylenes, Total	**0.0019**	**J**	0.0082	0.0011	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.0060*	*T J*	*mg/Kg*	☼	*2.00*		*11/12/20 22:24*	*11/24/20 14:27*	*1*
Pentane	*0.0090*	*T J N*	*mg/Kg*	☼	*2.20*	*109-66-0*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Pentane, 3-methyl-	*0.0061*	*T J N*	*mg/Kg*	☼	*3.29*	*96-14-0*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Cyclopentane, methyl-	*0.0060*	*T J N*	*mg/Kg*	☼	*4.15*	*96-37-7*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Hexane, 2-methyl-	*0.0048*	*T J N*	*mg/Kg*	☼	*4.76*	*591-76-4*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Hexane, 3-methyl-	*0.0041*	*T J N*	*mg/Kg*	☼	*4.94*	*589-34-4*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Benzene, 1-ethyl-2-methyl-	*0.0069*	*T J N*	*mg/Kg*	☼	*9.69*	*611-14-3*	*11/12/20 22:24*	*11/24/20 14:27*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*54 - 135*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
4-Bromofluorobenzene (Surr)	*94*		*50 - 131*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Dibromofluoromethane (Surr)	*97*		*50 - 141*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Toluene-d8 (Surr)	*103*		*52 - 141*	*11/12/20 22:24*	*11/24/20 14:27*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
1,2,4,5-Tetrachlorobenzene	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,2'-oxybis[1-chloropropane]	ND		0.049	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,3,4,6-Tetrachlorophenol	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4,5-Trichlorophenol	ND		0.075	0.034	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4,6-Trichlorophenol	ND		0.064	0.030	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4-Dichlorophenol	ND		0.049	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4-Dimethylphenol	ND		0.075	0.034	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4-Dinitrophenol	ND		1.1	0.38	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4-Dinitrotoluene	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,6-Dinitrotoluene	ND		0.056	0.026	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Chloronaphthalene	ND		0.038	0.0075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Chlorophenol	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Methylnaphthalene	**0.013**	**J**	0.038	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Methylphenol	ND		0.075	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Nitroaniline	ND		0.056	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Nitrophenol	ND		0.064	0.030	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
3,3'-Dichlorobenzidine	ND		0.38	0.11	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
3-Nitroaniline	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4,6-Dinitro-2-methylphenol	ND		0.56	0.26	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Client Sample ID: B55-PDI-SB-01 (16-16.9)
Date Collected: 11/10/20 10:30
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-2
Matrix: Soil
Percent Solids: 87.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Bromophenyl-phenylether	ND		0.056	0.026	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Chloro-3-methylphenol	ND		0.056	0.026	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
3,4-Methylphenol	ND		0.056	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Nitroaniline	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Nitrophenol	ND		0.56	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Acenaphthene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Acenaphthylene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Acetophenone	ND		0.056	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Anthracene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Atrazine	ND		0.49	0.23	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzaldehyde	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzo[a]anthracene	ND		0.019	0.0075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzo[a]pyrene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzo[b]fluoranthene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzo[g,h,i]perylene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzo[k]fluoranthene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Bis(2-chloroethoxy)methane	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Bis(2-chloroethyl)ether	ND		0.056	0.026	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Bis(2-ethylhexyl) phthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Butylbenzylphthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Caprolactam	ND		0.19	0.038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Carbazole	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Chrysene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Di-n-butyl phthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Di-n-octyl phthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Dibenz(a,h)anthracene	ND		0.019	0.0075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Dibenzofuran	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Diethyl phthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Dimethyl phthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Fluoranthene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Chloroaniline	ND		0.19	0.038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Fluorene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Chlorophenyl-phenyl ether	ND		0.049	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Hexachlorobenzene	ND		0.019	0.0075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Hexachlorobutadiene	ND		0.087	0.041	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Hexachlorocyclopentadiene	ND		0.56	0.23	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Hexachloroethane	ND		0.19	0.038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Indeno[1,2,3-cd]pyrene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Isophorone	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
N-Nitrosodi-n-propylamine	ND		0.056	0.026	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
N-Nitrosodiphenylamine	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Naphthalene	**0.033**		0.019	0.0075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Nitrobenzene	ND		0.075	0.030	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Phenanthrene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Aniline	ND		0.56	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Phenol	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Pyrene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Pentachlorophenol	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzyl alcohol	ND		0.56	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1

Client Sample ID: B55-PDI-SB-01 (16-16.9)

Date Collected: 11/10/20 10:30
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-2

Matrix: Soil
Percent Solids: 87.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
n,n'-Dimethylaniline	ND		0.19	0.038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Pyridine	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Triethylamine	ND	*- *1	5.6	1.9	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
1,4-Dioxane	ND		0.38	0.11	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.41*	*T J*	*mg/Kg*	☼	*2.07*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Furan, 2,5-dimethyl-	*0.17*	*T J N B*	*mg/Kg*	☼	*2.28*	*625-86-5*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*4.1*	*T J*	*mg/Kg*	☼	*3.27*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
3-Penten-2-one, 4-methyl-	*0.17*	*T J N*	*mg/Kg*	☼	*3.41*	*141-79-7*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*21*	*T J B*	*mg/Kg*	☼	*3.93*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
2-Cyclohexen-1-one	*0.20*	*T J N*	*mg/Kg*	☼	*4.82*	*930-68-7*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.19*	*T J*	*mg/Kg*	☼	*5.03*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.55*	*T J*	*mg/Kg*	☼	*5.45*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.17*	*T J*	*mg/Kg*	☼	*6.53*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.32*	*T J*	*mg/Kg*	☼	*7.11*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.28*	*T J*	*mg/Kg*	☼	*9.39*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.99*	*T J*	*mg/Kg*	☼	*10.09*		*11/16/20 00:40*	*11/24/20 14:14*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*98*		*45 - 108*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
Nitrobenzene-d5 (Surr)	*66*		*32 - 97*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
2-Fluorophenol (Surr)	*77*		*26 - 96*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
2-Fluorobiphenyl (Surr)	*81*		*39 - 100*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
2,4,6-Tribromophenol (Surr)	*51*		*13 - 121*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
Phenol-d5 (Surr)	*82*		*27 - 104*	*11/16/20 00:40*	*11/24/20 14:14*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**4.9**		4.5	1.5	mg/Kg	☼	11/16/20 00:40	11/24/20 17:45	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*87*		*45 - 108*	*11/16/20 00:40*	*11/24/20 17:45*	*2*
Nitrobenzene-d5 (Surr)	*64*		*32 - 97*	*11/16/20 00:40*	*11/24/20 17:45*	*2*
2-Fluorophenol (Surr)	*72*		*26 - 96*	*11/16/20 00:40*	*11/24/20 17:45*	*2*
2-Fluorobiphenyl (Surr)	*73*		*39 - 100*	*11/16/20 00:40*	*11/24/20 17:45*	*2*
2,4,6-Tribromophenol (Surr)	*42*		*13 - 121*	*11/16/20 00:40*	*11/24/20 17:45*	*2*
Phenol-d5 (Surr)	*76*		*27 - 104*	*11/16/20 00:40*	*11/24/20 17:45*	*2*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		57	28	ug/Kg	☼	11/14/20 08:33	11/18/20 21:56	1
Formaldehyde	**100**		85	28	ug/Kg	☼	11/14/20 08:33	11/18/20 21:56	1
Glutaraldehyde	ND		57	28	ug/Kg	☼	11/14/20 08:33	11/18/20 21:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*136*	*X*	*77 - 133*	*11/14/20 08:33*	*11/18/20 21:56*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**12.2**		1.0	1.0	%			11/12/20 21:26	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Client Sample ID: B55-PDI-SB-02 (10-12)
Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3
Matrix: Soil
Percent Solids: 85.2

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
trans-1,3-Dichloropropene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Ethylbenzene	**0.35**		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Styrene	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,4-Dichlorobenzene	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2-Dibromoethane	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2-Dichloroethane	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
4-Methyl-2-pentanone	ND		0.64	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Methylcyclohexane	**2.3**		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Toluene	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Chlorobenzene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Cyclohexane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2,4-Trichlorobenzene	ND		0.64	0.32	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,4-Dioxane	ND		16	2.4	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Dibromochloromethane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Tetrachloroethene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
cis-1,2-Dichloroethene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
trans-1,2-Dichloroethene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Methyl tertiary butyl ether	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
m&p-Xylene	**1.3**		0.32	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,3,5-Trimethylbenzene	**8.2**		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,3-Dichlorobenzene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Carbon tetrachloride	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
2-Hexanone	ND		0.64	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Acetone	ND		1.3	0.38	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Chloroform	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Benzene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,1,1-Trichloroethane	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Bromomethane	ND		0.32	0.045	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Chloromethane	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Bromochloromethane	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Chloroethane	ND		0.32	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Vinyl chloride	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Methylene Chloride	ND		0.32	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Carbon disulfide	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Bromoform	ND	*	0.64	0.32	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Bromodichloromethane	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,1-Dichloroethane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,1-Dichloroethene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Trichlorofluoromethane	ND		0.32	0.045	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Dichlorodifluoromethane	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Freon 113	ND		0.64	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2-Dichloropropane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
2-Butanone	ND		0.64	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,1,2-Trichloroethane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
2-Nitropropane	ND	*	0.64	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Trichloroethene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Methyl acetate	ND		0.32	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,1,2,2-Tetrachloroethane	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50

Client Sample ID: B55-PDI-SB-02 (10-12)
Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3
Matrix: Soil
Percent Solids: 85.2

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3-Trichlorobenzene	ND		0.64	0.32	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
o-Xylene	**0.22**	**J**	0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2-Dichlorobenzene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2-Dibromo-3-Chloropropane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Acetonitrile	ND		6.4	1.6	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Isopropylbenzene	**1.4**		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Chlorodifluoromethane	ND		0.64	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Cyclohexanone	ND		16	1.6	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Ethyl acetate	ND		0.32	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Ethyl ether	ND		0.32	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Isobutyl alcohol	ND		16	2.4	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Naphthalene	**0.57**		0.32	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
n-Butanol	ND		16	3.6	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
n-Butylbenzene	**2.5**		0.51	0.19	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
n-Heptane	**0.78**		0.51	0.19	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
p-Isopropyltoluene	**0.47**		0.32	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
sec-Butylbenzene	**0.75**		0.32	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
t-Butyl alcohol	ND		6.4	0.95	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
tert-Butylbenzene	ND		0.32	0.051	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Tetrahydrofuran	ND		0.51	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Xylenes, Total	**1.5**		0.64	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*3.9*	*T J*	*mg/Kg*	☼	*11.12*		*11/12/20 22:07*	*11/23/20 02:01*	*50*
Unknown	*2.5*	*T J*	*mg/Kg*	☼	*11.23*		*11/12/20 22:07*	*11/23/20 02:01*	*50*
Unknown	*2.9*	*T J*	*mg/Kg*	☼	*11.57*		*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 1-ethyl-3-methyl-	*4.1*	*T J N*	*mg/Kg*	☼	*12.56*	*620-14-4*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 1-ethyl-4-methyl-	*2.2*	*T J N*	*mg/Kg*	☼	*12.59*	*622-96-8*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 1-ethyl-2-methyl-	*2.0*	*T J N*	*mg/Kg*	☼	*12.78*	*611-14-3*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 1-methyl-3-propyl-	*2.3*	*T J N*	*mg/Kg*	☼	*13.37*	*1074-43-7*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 2-ethyl-1,3-dimethyl-	*2.5*	*T J N*	*mg/Kg*	☼	*13.68*	*2870-04-4*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 1,2,4,5-tetramethyl-	*1.9*	*T J N*	*mg/Kg*	☼	*13.96*	*95-93-2*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 2-ethenyl-1,4-dimethyl-	*2.7*	*T J N*	*mg/Kg*	☼	*14.30*	*2039-89-6*	*11/12/20 22:07*	*11/23/20 02:01*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*54 - 135*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
4-Bromofluorobenzene (Surr)	*134*	*X*	*50 - 131*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Dibromofluoromethane (Surr)	*105*		*50 - 141*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Toluene-d8 (Surr)	*113*		*52 - 141*	*11/12/20 22:07*	*11/23/20 02:01*	*50*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	**34**		3.2	0.32	mg/Kg	☼	11/12/20 22:07	11/23/20 02:22	500

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*54 - 135*	*11/12/20 22:07*	*11/23/20 02:22*	*500*
4-Bromofluorobenzene (Surr)	*137*	*X*	*50 - 131*	*11/12/20 22:07*	*11/23/20 02:22*	*500*
Dibromofluoromethane (Surr)	*105*		*50 - 141*	*11/12/20 22:07*	*11/23/20 02:22*	*500*
Toluene-d8 (Surr)	*113*		*52 - 141*	*11/12/20 22:07*	*11/23/20 02:22*	*500*

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Client Sample ID: B55-PDI-SB-02 (10-12)
Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3
Matrix: Soil
Percent Solids: 85.2

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
1,2,4,5-Tetrachlorobenzene	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,2'-oxybis[1-chloropropane]	ND		0.050	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,3,4,6-Tetrachlorophenol	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4,5-Trichlorophenol	ND		0.077	0.035	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4,6-Trichlorophenol	ND		0.065	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4-Dichlorophenol	ND		0.050	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4-Dimethylphenol	ND		0.077	0.035	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4-Dinitrophenol	ND		1.2	0.39	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4-Dinitrotoluene	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,6-Dinitrotoluene	ND		0.058	0.027	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Chloronaphthalene	ND		0.039	0.0077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Chlorophenol	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Methylnaphthalene	**0.41**		0.039	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Methylphenol	ND		0.077	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Nitroaniline	ND		0.058	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Nitrophenol	ND		0.065	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
3,3'-Dichlorobenzidine	ND		0.39	0.12	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
3-Nitroaniline	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4,6-Dinitro-2-methylphenol	ND		0.58	0.27	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Bromophenyl-phenylether	ND		0.058	0.027	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Chloro-3-methylphenol	ND		0.058	0.027	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
3,4-Methylphenol	ND		0.058	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Nitroaniline	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Nitrophenol	ND		0.58	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Acenaphthene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Acenaphthylene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Acetophenone	ND		0.058	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Anthracene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Atrazine	ND		0.50	0.23	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzaldehyde	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzo[a]anthracene	ND		0.019	0.0077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzo[a]pyrene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzo[b]fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzo[g,h,i]perylene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzo[k]fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Bis(2-chloroethoxy)methane	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Bis(2-chloroethyl)ether	ND		0.058	0.027	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Bis(2-ethylhexyl) phthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Butylbenzylphthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Caprolactam	ND		0.19	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Carbazole	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Chrysene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Di-n-butyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Di-n-octyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Dibenz(a,h)anthracene	ND		0.019	0.0077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Dibenzofuran	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Diethyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Dimethyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1

Client Sample ID: B55-PDI-SB-02 (10-12)
Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3
Matrix: Soil
Percent Solids: 85.2

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Chloroaniline	ND		0.19	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Fluorene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Chlorophenyl-phenyl ether	ND		0.050	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Hexachlorobenzene	ND		0.019	0.0077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Hexachlorobutadiene	ND		0.089	0.042	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Hexachlorocyclopentadiene	ND		0.58	0.23	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Hexachloroethane	ND		0.19	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Indeno[1,2,3-cd]pyrene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Isophorone	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
N-Nitrosodi-n-propylamine	ND		0.058	0.027	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
N-Nitrosodiphenylamine	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Naphthalene	**0.060**		0.019	0.0077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Nitrobenzene	ND		0.077	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Phenanthrene	**0.014**	**J**	0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Aniline	ND		0.58	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Phenol	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Pyrene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Pentachlorophenol	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzyl alcohol	ND		0.58	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
n,n'-Dimethylaniline	ND		0.19	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Pyridine	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Triethylamine	ND	*- *1	5.8	1.9	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
1,4-Dioxane	ND		0.39	0.12	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*16*	*T J*	*mg/Kg*	☼	*3.30*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*25*	*T J B*	*mg/Kg*	☼	*3.93*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
2-Cyclohexen-1-one	*0.44*	*T J N*	*mg/Kg*	☼	*4.82*	*930-68-7*	*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.61*	*T J*	*mg/Kg*	☼	*5.03*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Benzene, 1,3,5-trimethyl-	*0.59*	*T J N*	*mg/Kg*	☼	*5.38*	*108-67-8*	*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.52*	*T J*	*mg/Kg*	☼	*5.45*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Benzene, 1,2-diethyl-	*0.80*	*T J N*	*mg/Kg*	☼	*5.86*	*135-01-3*	*11/16/20 00:40*	*11/24/20 14:38*	*1*
Benzene, 2-ethyl-1,4-dimethyl-	*0.40*	*T J N*	*mg/Kg*	☼	*6.00*	*1758-88-9*	*11/16/20 00:40*	*11/24/20 14:38*	*1*
1,2,4-Trithiolane	*1.8*	*T J N*	*mg/Kg*	☼	*6.21*	*289-16-7*	*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.74*	*T J*	*mg/Kg*	☼	*6.32*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
1-Phenyl-1-butene	*0.53*	*T J N*	*mg/Kg*	☼	*6.53*	*824-90-8*	*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.60*	*T J*	*mg/Kg*	☼	*7.11*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*1.4*	*T J*	*mg/Kg*	☼	*8.33*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.56*	*T J*	*mg/Kg*	☼	*8.42*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.43*	*T J*	*mg/Kg*	☼	*8.54*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*1.3*	*T J N*	*mg/Kg*	☼	*8.62*	*7560-83-0*	*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.93*	*T J*	*mg/Kg*	☼	*8.66*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.64*	*T J*	*mg/Kg*	☼	*9.34*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.50*	*T J*	*mg/Kg*	☼	*9.38*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.61*	*T J*	*mg/Kg*	☼	*9.41*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.70*	*T J*	*mg/Kg*	☼	*9.44*		*11/16/20 00:40*	*11/24/20 14:38*	*1*

Client Sample ID: B55-PDI-SB-02 (10-12)

Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3

Matrix: Soil
Percent Solids: 85.2

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Ethanone, 1-(2,7-dimethylpyrazolo[1,5-a]pyridin-3-yl)-	2.6	T J N	mg/Kg	☼	9.69	17408-30-9	11/16/20 00:40	11/24/20 14:38	1
Unknown	0.68	T J	mg/Kg	☼	9.77		11/16/20 00:40	11/24/20 14:38	1
Unknown	0.42	T J	mg/Kg	☼	10.04		11/16/20 00:40	11/24/20 14:38	1
Unknown	0.64	T J	mg/Kg	☼	10.09		11/16/20 00:40	11/24/20 14:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	98		45 - 108	11/16/20 00:40	11/24/20 14:38	1
Nitrobenzene-d5 (Surr)	65		32 - 97	11/16/20 00:40	11/24/20 14:38	1
2-Fluorophenol (Surr)	79		26 - 96	11/16/20 00:40	11/24/20 14:38	1
2-Fluorobiphenyl (Surr)	87		39 - 100	11/16/20 00:40	11/24/20 14:38	1
2,4,6-Tribromophenol (Surr)	71		13 - 121	11/16/20 00:40	11/24/20 14:38	1
Phenol-d5 (Surr)	87		27 - 104	11/16/20 00:40	11/24/20 14:38	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**8.6**		6.9	2.3	mg/Kg	☼	11/16/20 00:40	11/26/20 16:33	3

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	88		45 - 108	11/16/20 00:40	11/26/20 16:33	3
Nitrobenzene-d5 (Surr)	63		32 - 97	11/16/20 00:40	11/26/20 16:33	3
2-Fluorophenol (Surr)	71		26 - 96	11/16/20 00:40	11/26/20 16:33	3
2-Fluorobiphenyl (Surr)	77		39 - 100	11/16/20 00:40	11/26/20 16:33	3
2,4,6-Tribromophenol (Surr)	54		13 - 121	11/16/20 00:40	11/26/20 16:33	3
Phenol-d5 (Surr)	76		27 - 104	11/16/20 00:40	11/26/20 16:33	3

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		59	29	ug/Kg	☼	11/14/20 08:33	11/18/20 22:08	1
Formaldehyde	**81**	**J**	88	29	ug/Kg	☼	11/14/20 08:33	11/18/20 22:08	1
Glutaraldehyde	ND		59	29	ug/Kg	☼	11/14/20 08:33	11/18/20 22:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	132		77 - 133	11/14/20 08:33	11/18/20 22:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**14.8**		1.0	1.0	%			11/12/20 21:26	1

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Soil — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(54-135)	(50-131)	(50-141)	(52-141)
410-20273-1	B55-PDI-SB-01 (8-10)	100	126	98	126
410-20273-1 - DL	B55-PDI-SB-01 (8-10)	95	130	96	120
410-20273-2	B55-PDI-SB-01 (16-16.9)	101	94	97	103
410-20273-3	B55-PDI-SB-02 (10-12)	110	134 X	105	113
410-20273-3 - DL	B55-PDI-SB-02 (10-12)	111	137 X	105	113

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(54-135)	(50-131)	(50-141)	(52-141)
LCS 410-69161/5	Lab Control Sample	102	91	100	98
LCS 410-69161/7	Lab Control Sample	97	92	95	94
LCS 410-69809/5	Lab Control Sample	102	100	100	101
LCS 410-69809/7	Lab Control Sample	106	99	100	100
LCSD 410-69161/6	Lab Control Sample Dup	103	93	102	100
LCSD 410-69161/8	Lab Control Sample Dup	99	90	96	94
LCSD 410-69809/6	Lab Control Sample Dup	101	100	100	100
LCSD 410-69809/8	Lab Control Sample Dup	102	99	100	101
MB 410-69161/9	Method Blank	100	89	96	96
MB 410-69809/10	Method Blank	105	99	100	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Soil — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TPHd14	NBZ	2FP	FBP	TBP	PHL
Lab Sample ID	Client Sample ID	(45-108)	(32-97)	(26-96)	(39-100)	(13-121)	(27-104)
410-20273-1	B55-PDI-SB-01 (8-10)	93	59	76	85	19	81
410-20273-1 - DL	B55-PDI-SB-01 (8-10)	84	64	76	74	16	79
410-20273-2	B55-PDI-SB-01 (16-16.9)	98	66	77	81	51	82
410-20273-2 - DL	B55-PDI-SB-01 (16-16.9)	87	64	72	73	42	76
410-20273-3	B55-PDI-SB-02 (10-12)	98	65	79	87	71	87
410-20273-3 - DL	B55-PDI-SB-02 (10-12)	88	63	71	77	54	76

Surrogate Legend

TPHd14 = p-Terphenyl-d14 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
2FP = 2-Fluorophenol (Surr)

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	TPHd14 (45-108)	NBZ (32-97)	2FP (26-96)	FBP (39-100)	TBP (13-121)	PHL (27-104)
LCS 410-66233/2-A	Lab Control Sample	98	71	80	85	99	86
LCS 410-66233/5-A	Lab Control Sample	104	69	76	79	90	78
LCSD 410-66233/6-A	Lab Control Sample Dup	106	64	69	80	92	74
MB 410-66233/1-A	Method Blank	110 S1+	65	71	75	83	71

Surrogate Legend

TPHd14 = p-Terphenyl-d14 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
2FP = 2-Fluorophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
PHL = Phenol-d5 (Surr)

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Soil **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	BTRA (77-133)
410-20273-1	B55-PDI-SB-01 (8-10)	133
410-20273-1 MS	B55-PDI-SB-01 (8-10)	120
410-20273-1 MSD	B55-PDI-SB-01 (8-10)	126
410-20273-2	B55-PDI-SB-01 (16-16.9)	136 X
410-20273-3	B55-PDI-SB-02 (10-12)	132

Surrogate Legend

BTRA = Butyraldehyde

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	BTRA (77-133)
LCS 410-66002/2-A	Lab Control Sample	128
MB 410-66002/1-A	Method Blank	123

Surrogate Legend

BTRA = Butyraldehyde

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 410-69161/9
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
1,2,4-Trimethylbenzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,2-Dichloroethane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
1,2,4-Trichlorobenzene	ND		0.50	0.25	mg/Kg			11/22/20 21:04	50
1,4-Dichlorobenzene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
1,4-Dioxane	ND		13	1.9	mg/Kg			11/22/20 21:04	50
4-Methyl-2-pentanone	ND		0.50	0.050	mg/Kg			11/22/20 21:04	50
1,3,5-Trimethylbenzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,3-Dichlorobenzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
2-Hexanone	ND		0.50	0.050	mg/Kg			11/22/20 21:04	50
Acetone	ND		1.0	0.30	mg/Kg			11/22/20 21:04	50
Benzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,1,1-Trichloroethane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
Bromomethane	ND		0.25	0.035	mg/Kg			11/22/20 21:04	50
Carbon tetrachloride	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Chlorobenzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Bromochloromethane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
Chloroethane	ND		0.25	0.050	mg/Kg			11/22/20 21:04	50
Chloroform	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
Chloromethane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
Carbon disulfide	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
cis-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Bromoform	ND		0.50	0.25	mg/Kg			11/22/20 21:04	50
cis-1,3-Dichloropropene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
Bromodichloromethane	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
Cyclohexane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,1-Dichloroethane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,1-Dichloroethene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Dibromochloromethane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Dichlorodifluoromethane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
1,2-Dichloropropane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Ethylbenzene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
2-Butanone	ND		0.50	0.10	mg/Kg			11/22/20 21:04	50
Freon 113	ND		0.50	0.030	mg/Kg			11/22/20 21:04	50
1,1,2-Trichloroethane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
2-Nitropropane	ND		0.50	0.10	mg/Kg			11/22/20 21:04	50
m&p-Xylene	ND		0.25	0.050	mg/Kg			11/22/20 21:04	50
Methyl acetate	ND		0.25	0.050	mg/Kg			11/22/20 21:04	50
1,1,2,2-Tetrachloroethane	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
Methyl tertiary butyl ether	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,2,3-Trichlorobenzene	ND		0.50	0.25	mg/Kg			11/22/20 21:04	50
Methylcyclohexane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
Methylene Chloride	ND		0.25	0.10	mg/Kg			11/22/20 21:04	50
1,2-Dichlorobenzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,2-Dibromo-3-Chloropropane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Acetonitrile	ND		5.0	1.3	mg/Kg			11/22/20 21:04	50
Isopropylbenzene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
o-Xylene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-69161/9
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorodifluoromethane	ND		0.50	0.10	mg/Kg			11/22/20 21:04	50
Styrene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
Cyclohexanone	ND		13	1.3	mg/Kg			11/22/20 21:04	50
Ethyl acetate	ND		0.25	0.050	mg/Kg			11/22/20 21:04	50
Ethyl ether	ND		0.25	0.050	mg/Kg			11/22/20 21:04	50
Tetrachloroethene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Isobutyl alcohol	ND		13	1.9	mg/Kg			11/22/20 21:04	50
Naphthalene	ND		0.25	0.10	mg/Kg			11/22/20 21:04	50
Toluene	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
n-Butanol	ND		13	2.8	mg/Kg			11/22/20 21:04	50
trans-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
n-Butylbenzene	ND		0.40	0.15	mg/Kg			11/22/20 21:04	50
trans-1,3-Dichloropropene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
n-Heptane	ND		0.40	0.15	mg/Kg			11/22/20 21:04	50
Trichloroethene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Trichlorofluoromethane	ND		0.25	0.035	mg/Kg			11/22/20 21:04	50
p-Isopropyltoluene	ND		0.25	0.10	mg/Kg			11/22/20 21:04	50
Vinyl chloride	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
sec-Butylbenzene	ND		0.25	0.10	mg/Kg			11/22/20 21:04	50
t-Butyl alcohol	ND		5.0	0.75	mg/Kg			11/22/20 21:04	50
tert-Butylbenzene	ND		0.25	0.040	mg/Kg			11/22/20 21:04	50
Tetrahydrofuran	ND		0.40	0.050	mg/Kg			11/22/20 21:04	50
Xylenes, Total	ND		0.50	0.070	mg/Kg			11/22/20 21:04	50

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*					*11/22/20 21:04*	*50*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*		*11/22/20 21:04*	*50*
4-Bromofluorobenzene (Surr)	*89*		*50 - 131*		*11/22/20 21:04*	*50*
Dibromofluoromethane (Surr)	*96*		*50 - 141*		*11/22/20 21:04*	*50*
Toluene-d8 (Surr)	*96*		*52 - 141*		*11/22/20 21:04*	*50*

Lab Sample ID: LCS 410-69161/5
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	1.00	1.07		mg/Kg		107	76 - 120
1,2,4-Trimethylbenzene	1.00	0.950		mg/Kg		95	73 - 120
1,2-Dichloroethane	1.00	0.971		mg/Kg		97	71 - 128
1,2,4-Trichlorobenzene	1.00	0.953		mg/Kg		95	56 - 130
1,4-Dichlorobenzene	1.00	1.02		mg/Kg		102	80 - 120
1,4-Dioxane	25.0	28.0		mg/Kg		112	62 - 131
4-Methyl-2-pentanone	5.00	4.52		mg/Kg		90	67 - 128
1,3,5-Trimethylbenzene	1.00	0.966		mg/Kg		97	73 - 120
1,3-Dichlorobenzene	1.00	1.02		mg/Kg		102	75 - 120
2-Hexanone	5.00	4.17		mg/Kg		83	54 - 140

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69161/5
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	7.50	4.77		mg/Kg		64	41 - 150
Benzene	1.00	0.991		mg/Kg		99	80 - 120
1,1,1-Trichloroethane	1.00	1.12		mg/Kg		112	69 - 123
Bromomethane	1.00	1.22		mg/Kg		122	45 - 140
Carbon tetrachloride	1.00	1.25		mg/Kg		125	64 - 134
Chlorobenzene	1.00	1.03		mg/Kg		103	80 - 120
Bromochloromethane	1.00	1.02		mg/Kg		102	72 - 124
Chloroethane	1.00	0.819		mg/Kg		82	43 - 135
Chloroform	1.00	0.991		mg/Kg		99	80 - 120
Chloromethane	1.00	0.776		mg/Kg		78	56 - 120
Carbon disulfide	1.00	1.04		mg/Kg		104	64 - 133
cis-1,2-Dichloroethene	1.00	1.08		mg/Kg		108	80 - 125
Bromoform	1.00	1.31	*	mg/Kg		131	51 - 127
cis-1,3-Dichloropropene	1.00	1.12		mg/Kg		112	66 - 120
Bromodichloromethane	1.00	1.12		mg/Kg		112	70 - 120
Cyclohexane	1.00	0.949		mg/Kg		95	58 - 126
1,1-Dichloroethane	1.00	0.963		mg/Kg		96	79 - 120
1,1-Dichloroethene	1.00	1.05		mg/Kg		105	73 - 129
Dibromochloromethane	1.00	1.18		mg/Kg		118	69 - 125
Dichlorodifluoromethane	1.00	0.916		mg/Kg		92	21 - 127
1,2-Dichloropropane	1.00	0.982		mg/Kg		98	80 - 120
Ethylbenzene	1.00	0.986		mg/Kg		99	78 - 120
2-Butanone	7.50	5.01		mg/Kg		67	57 - 128
Freon 113	1.00	1.03		mg/Kg		103	64 - 135
1,1,2-Trichloroethane	1.00	1.05		mg/Kg		105	80 - 120
2-Nitropropane	1.00	2.48	*	mg/Kg		248	27 - 183
m&p-Xylene	2.00	2.05		mg/Kg		103	80 - 120
Methyl acetate	1.00	0.972		mg/Kg		97	67 - 128
1,1,2,2-Tetrachloroethane	1.00	0.924		mg/Kg		92	69 - 125
Methyl tertiary butyl ether	1.00	0.947		mg/Kg		95	72 - 120
1,2,3-Trichlorobenzene	1.00	0.845		mg/Kg		85	57 - 131
Methylcyclohexane	1.00	1.01		mg/Kg		101	61 - 124
Methylene Chloride	1.00	0.983		mg/Kg		98	76 - 122
1,2-Dichlorobenzene	1.00	0.984		mg/Kg		98	76 - 120
1,2-Dibromo-3-Chloropropane	1.00	0.792		mg/Kg		79	48 - 134
Isopropylbenzene	1.00	0.995		mg/Kg		99	77 - 120
o-Xylene	1.00	0.986		mg/Kg		99	75 - 120
Styrene	1.00	1.01		mg/Kg		101	76 - 120
Cyclohexanone	25.0	23.1		mg/Kg		92	47 - 136
Tetrachloroethene	1.00	1.08		mg/Kg		108	73 - 120
Isobutyl alcohol	25.0	24.8		mg/Kg		99	69 - 129
Naphthalene	1.00	0.759		mg/Kg		76	48 - 130
Toluene	1.00	1.00		mg/Kg		100	80 - 120
n-Butanol	50.0	57.8		mg/Kg		116	63 - 123
trans-1,2-Dichloroethene	1.00	1.02		mg/Kg		102	80 - 126
n-Butylbenzene	1.00	0.929		mg/Kg		93	71 - 121
trans-1,3-Dichloropropene	1.00	1.08		mg/Kg		108	68 - 122
n-Heptane	1.00	1.02		mg/Kg		102	50 - 141
Trichloroethene	1.00	1.02		mg/Kg		102	80 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69161/5
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Trichlorofluoromethane	1.00	0.932		mg/Kg		93	55 - 134
p-Isopropyltoluene	1.00	0.979		mg/Kg		98	72 - 120
Vinyl chloride	1.00	0.865		mg/Kg		87	52 - 120
sec-Butylbenzene	1.00	0.960		mg/Kg		96	72 - 120
t-Butyl alcohol	10.0	10.7		mg/Kg		107	74 - 121
tert-Butylbenzene	1.00	1.02		mg/Kg		102	68 - 120
Tetrahydrofuran	5.00	4.38		mg/Kg		88	71 - 127
Xylenes, Total	3.00	3.04		mg/Kg		101	75 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*54 - 135*
4-Bromofluorobenzene (Surr)	*91*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*98*		*52 - 141*

Lab Sample ID: LCS 410-69161/7
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetonitrile	7.50	7.01		mg/Kg		93	61 - 120
Chlorodifluoromethane	1.00	0.856		mg/Kg		86	60 - 133
Ethyl acetate	1.00	0.879		mg/Kg		88	65 - 133
Ethyl ether	1.00	1.03		mg/Kg		103	59 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*54 - 135*
4-Bromofluorobenzene (Surr)	*92*		*50 - 131*
Dibromofluoromethane (Surr)	*95*		*50 - 141*
Toluene-d8 (Surr)	*94*		*52 - 141*

Lab Sample ID: LCSD 410-69161/6
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane	1.00	1.09		mg/Kg		109	76 - 120	2	30
1,2,4-Trimethylbenzene	1.00	0.976		mg/Kg		98	73 - 120	3	30
1,2-Dichloroethane	1.00	0.996		mg/Kg		100	71 - 128	3	30
1,2,4-Trichlorobenzene	1.00	1.00		mg/Kg		100	56 - 130	5	30
1,4-Dichlorobenzene	1.00	1.04		mg/Kg		104	80 - 120	2	30
1,4-Dioxane	25.0	27.8		mg/Kg		111	62 - 131	0	30
4-Methyl-2-pentanone	5.00	4.49		mg/Kg		90	67 - 128	1	30
1,3,5-Trimethylbenzene	1.00	0.988		mg/Kg		99	73 - 120	2	30
1,3-Dichlorobenzene	1.00	1.03		mg/Kg		103	75 - 120	2	30
2-Hexanone	5.00	4.24		mg/Kg		85	54 - 140	2	30
Acetone	7.50	4.96		mg/Kg		66	41 - 150	4	30
Benzene	1.00	1.00		mg/Kg		100	80 - 120	1	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69161/6
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	1.00	1.12		mg/Kg		112	69 - 123	0	30
Bromomethane	1.00	1.13		mg/Kg		113	45 - 140	8	30
Carbon tetrachloride	1.00	1.25		mg/Kg		125	64 - 134	0	30
Chlorobenzene	1.00	1.04		mg/Kg		104	80 - 120	1	30
Bromochloromethane	1.00	1.03		mg/Kg		103	72 - 124	1	30
Chloroethane	1.00	0.773		mg/Kg		77	43 - 135	6	30
Chloroform	1.00	1.01		mg/Kg		101	80 - 120	1	30
Chloromethane	1.00	0.785		mg/Kg		78	56 - 120	1	30
Carbon disulfide	1.00	1.06		mg/Kg		106	64 - 133	1	30
cis-1,2-Dichloroethene	1.00	1.09		mg/Kg		109	80 - 125	1	30
Bromoform	1.00	1.32	*	mg/Kg		132	51 - 127	1	30
cis-1,3-Dichloropropene	1.00	1.11		mg/Kg		111	66 - 120	0	30
Bromodichloromethane	1.00	1.15		mg/Kg		115	70 - 120	3	30
Cyclohexane	1.00	0.957		mg/Kg		96	58 - 126	1	30
1,1-Dichloroethane	1.00	0.987		mg/Kg		99	79 - 120	2	30
1,1-Dichloroethene	1.00	1.05		mg/Kg		105	73 - 129	1	30
Dibromochloromethane	1.00	1.20		mg/Kg		120	69 - 125	2	30
Dichlorodifluoromethane	1.00	0.985		mg/Kg		99	21 - 127	7	30
1,2-Dichloropropane	1.00	1.01		mg/Kg		101	80 - 120	2	30
Ethylbenzene	1.00	0.989		mg/Kg		99	78 - 120	0	30
2-Butanone	7.50	5.21		mg/Kg		70	57 - 128	4	30
Freon 113	1.00	1.02		mg/Kg		102	64 - 135	0	30
1,1,2-Trichloroethane	1.00	1.07		mg/Kg		107	80 - 120	2	30
2-Nitropropane	1.00	2.44	*	mg/Kg		244	27 - 183	2	30
m&p-Xylene	2.00	2.07		mg/Kg		103	80 - 120	1	30
Methyl acetate	1.00	0.861		mg/Kg		86	67 - 128	12	30
1,1,2,2-Tetrachloroethane	1.00	0.961		mg/Kg		96	69 - 125	4	30
Methyl tertiary butyl ether	1.00	0.958		mg/Kg		96	72 - 120	1	30
1,2,3-Trichlorobenzene	1.00	0.889		mg/Kg		89	57 - 131	5	30
Methylcyclohexane	1.00	1.04		mg/Kg		104	61 - 124	2	30
Methylene Chloride	1.00	1.01		mg/Kg		101	76 - 122	2	30
1,2-Dichlorobenzene	1.00	1.00		mg/Kg		100	76 - 120	2	30
1,2-Dibromo-3-Chloropropane	1.00	0.809		mg/Kg		81	48 - 134	2	30
Isopropylbenzene	1.00	1.01		mg/Kg		101	77 - 120	2	30
o-Xylene	1.00	1.01		mg/Kg		101	75 - 120	3	30
Styrene	1.00	1.03		mg/Kg		103	76 - 120	2	30
Cyclohexanone	25.0	23.1		mg/Kg		92	47 - 136	0	30
Tetrachloroethene	1.00	1.10		mg/Kg		110	73 - 120	1	30
Isobutyl alcohol	25.0	22.8		mg/Kg		91	69 - 129	8	30
Naphthalene	1.00	0.806		mg/Kg		81	48 - 130	6	30
Toluene	1.00	1.02		mg/Kg		102	80 - 120	2	30
n-Butanol	50.0	59.4		mg/Kg		119	63 - 123	3	30
trans-1,2-Dichloroethene	1.00	1.05		mg/Kg		105	80 - 126	3	30
n-Butylbenzene	1.00	0.975		mg/Kg		97	71 - 121	5	30
trans-1,3-Dichloropropene	1.00	1.09		mg/Kg		109	68 - 122	1	30
n-Heptane	1.00	1.04		mg/Kg		104	50 - 141	2	30
Trichloroethene	1.00	1.02		mg/Kg		102	80 - 120	1	30
Trichlorofluoromethane	1.00	0.935		mg/Kg		93	55 - 134	0	30
p-Isopropyltoluene	1.00	1.01		mg/Kg		101	72 - 120	3	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69161/6
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride			1.00	0.874		mg/Kg		87	52 - 120	1	30
sec-Butylbenzene			1.00	0.990		mg/Kg		99	72 - 120	3	30
t-Butyl alcohol			10.0	10.2		mg/Kg		102	74 - 121	4	30
tert-Butylbenzene			1.00	1.04		mg/Kg		104	68 - 120	2	30
Tetrahydrofuran			5.00	4.31		mg/Kg		86	71 - 127	2	30
Xylenes, Total			3.00	3.08		mg/Kg		103	75 - 120	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*54 - 135*
4-Bromofluorobenzene (Surr)	*93*		*50 - 131*
Dibromofluoromethane (Surr)	*102*		*50 - 141*
Toluene-d8 (Surr)	*100*		*52 - 141*

Lab Sample ID: LCSD 410-69161/8
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetonitrile			7.50	6.83		mg/Kg		91	61 - 120	3	30
Chlorodifluoromethane			1.00	0.833		mg/Kg		83	60 - 133	3	30
Ethyl acetate			1.00	0.893		mg/Kg		89	65 - 133	1	30
Ethyl ether			1.00	1.05		mg/Kg		105	59 - 135	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*54 - 135*
4-Bromofluorobenzene (Surr)	*90*		*50 - 131*
Dibromofluoromethane (Surr)	*96*		*50 - 141*
Toluene-d8 (Surr)	*94*		*52 - 141*

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
1,2,4-Trimethylbenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2-Dichloroethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
1,2,4-Trichlorobenzene	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
1,4-Dichlorobenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
1,4-Dioxane	ND		0.25	0.037	mg/Kg			11/24/20 11:24	1
4-Methyl-2-pentanone	ND		0.010	0.0010	mg/Kg			11/24/20 11:24	1
1,3,5-Trimethylbenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,3-Dichlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
2-Hexanone	ND		0.010	0.0010	mg/Kg			11/24/20 11:24	1
Acetone	ND		0.020	0.0060	mg/Kg			11/24/20 11:24	1
Benzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1,1-Trichloroethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Bromomethane	ND		0.0050	0.00070	mg/Kg			11/24/20 11:24	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Chlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Bromochloromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Chloroethane	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Chloroform	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Chloromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Carbon disulfide	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
cis-1,2-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Bromoform	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
cis-1,3-Dichloropropene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Bromodichloromethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Cyclohexane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1-Dichloroethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Dibromochloromethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Dichlorodifluoromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
1,2-Dichloropropane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Ethylbenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
2-Butanone	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
Freon 113	ND		0.010	0.00060	mg/Kg			11/24/20 11:24	1
1,1,2-Trichloroethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
2-Nitropropane	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
m&p-Xylene	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Methyl acetate	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
1,1,2,2-Tetrachloroethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Methyl tertiary butyl ether	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2,3-Trichlorobenzene	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
Methylcyclohexane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Methylene Chloride	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
1,2-Dichlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2-Dibromo-3-Chloropropane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Acetonitrile	ND		0.10	0.025	mg/Kg			11/24/20 11:24	1
Isopropylbenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
o-Xylene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Chlorodifluoromethane	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
Styrene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Cyclohexanone	ND		0.25	0.025	mg/Kg			11/24/20 11:24	1
Ethyl acetate	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Ethyl ether	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Tetrachloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Isobutyl alcohol	ND		0.25	0.038	mg/Kg			11/24/20 11:24	1
Naphthalene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
Toluene	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
n-Butanol	ND		0.25	0.056	mg/Kg			11/24/20 11:24	1
trans-1,2-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
n-Butylbenzene	ND		0.0080	0.0030	mg/Kg			11/24/20 11:24	1
trans-1,3-Dichloropropene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
n-Heptane	ND		0.0080	0.0030	mg/Kg			11/24/20 11:24	1
Trichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichlorofluoromethane	ND		0.0050	0.00070	mg/Kg			11/24/20 11:24	1
p-Isopropyltoluene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
Vinyl chloride	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
sec-Butylbenzene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
t-Butyl alcohol	ND		0.10	0.015	mg/Kg			11/24/20 11:24	1
tert-Butylbenzene	ND		0.0050	0.00080	mg/Kg			11/24/20 11:24	1
Tetrahydrofuran	ND		0.0080	0.0010	mg/Kg			11/24/20 11:24	1
Xylenes, Total	ND		0.010	0.0014	mg/Kg			11/24/20 11:24	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*					*11/24/20 11:24*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*54 - 135*		*11/24/20 11:24*	*1*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*		*11/24/20 11:24*	*1*
Dibromofluoromethane (Surr)	*100*		*50 - 141*		*11/24/20 11:24*	*1*
Toluene-d8 (Surr)	*101*		*52 - 141*		*11/24/20 11:24*	*1*

Lab Sample ID: LCS 410-69809/5
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	0.0200	0.0215		mg/Kg		107	76 - 120
1,2,4-Trimethylbenzene	0.0200	0.0223		mg/Kg		111	73 - 120
1,2-Dichloroethane	0.0200	0.0215		mg/Kg		107	71 - 128
1,2,4-Trichlorobenzene	0.0200	0.0219		mg/Kg		109	56 - 130
1,4-Dichlorobenzene	0.0200	0.0216		mg/Kg		108	80 - 120
1,4-Dioxane	0.500	0.559		mg/Kg		112	62 - 131
4-Methyl-2-pentanone	0.100	0.109		mg/Kg		109	67 - 128
1,3,5-Trimethylbenzene	0.0200	0.0222		mg/Kg		111	73 - 120
1,3-Dichlorobenzene	0.0200	0.0217		mg/Kg		109	75 - 120
2-Hexanone	0.100	0.108		mg/Kg		108	54 - 140
Acetone	0.150	0.142		mg/Kg		95	41 - 150
Benzene	0.0200	0.0211		mg/Kg		105	80 - 120
1,1,1-Trichloroethane	0.0200	0.0212		mg/Kg		106	69 - 123
Bromomethane	0.0200	0.0219		mg/Kg		110	45 - 140
Carbon tetrachloride	0.0200	0.0211		mg/Kg		105	64 - 134
Chlorobenzene	0.0200	0.0212		mg/Kg		106	80 - 120
Bromochloromethane	0.0200	0.0210		mg/Kg		105	72 - 124
Chloroethane	0.0200	0.0205		mg/Kg		102	43 - 135
Chloroform	0.0200	0.0217		mg/Kg		109	80 - 120
Chloromethane	0.0200	0.0178		mg/Kg		89	56 - 120
Carbon disulfide	0.0200	0.0214		mg/Kg		107	64 - 133
cis-1,2-Dichloroethene	0.0200	0.0222		mg/Kg		111	80 - 125
Bromoform	0.0200	0.0195		mg/Kg		98	51 - 127
cis-1,3-Dichloropropene	0.0200	0.0210		mg/Kg		105	66 - 120
Bromodichloromethane	0.0200	0.0208		mg/Kg		104	70 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69809/5
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyclohexane	0.0200	0.0209		mg/Kg		105	58 - 126
1,1-Dichloroethane	0.0200	0.0214		mg/Kg		107	79 - 120
1,1-Dichloroethene	0.0200	0.0226		mg/Kg		113	73 - 129
Dibromochloromethane	0.0200	0.0212		mg/Kg		106	69 - 125
Dichlorodifluoromethane	0.0200	0.0144		mg/Kg		72	21 - 127
1,2-Dichloropropane	0.0200	0.0218		mg/Kg		109	80 - 120
Ethylbenzene	0.0200	0.0217		mg/Kg		109	78 - 120
2-Butanone	0.150	0.155		mg/Kg		104	57 - 128
Freon 113	0.0200	0.0189		mg/Kg		95	64 - 135
1,1,2-Trichloroethane	0.0200	0.0219		mg/Kg		110	80 - 120
2-Nitropropane	0.0200	0.0166		mg/Kg		83	27 - 183
m&p-Xylene	0.0400	0.0432		mg/Kg		108	80 - 120
Methyl acetate	0.0200	0.0193		mg/Kg		97	67 - 128
1,1,2,2-Tetrachloroethane	0.0200	0.0217		mg/Kg		109	69 - 125
Methyl tertiary butyl ether	0.0200	0.0213		mg/Kg		106	72 - 120
1,2,3-Trichlorobenzene	0.0200	0.0221		mg/Kg		111	57 - 131
Methylcyclohexane	0.0200	0.0195		mg/Kg		98	61 - 124
Methylene Chloride	0.0200	0.0209		mg/Kg		104	76 - 122
1,2-Dichlorobenzene	0.0200	0.0216		mg/Kg		108	76 - 120
1,2-Dibromo-3-Chloropropane	0.0200	0.0206		mg/Kg		103	48 - 134
Isopropylbenzene	0.0200	0.0224		mg/Kg		112	77 - 120
o-Xylene	0.0200	0.0211		mg/Kg		106	75 - 120
Styrene	0.0200	0.0207		mg/Kg		104	76 - 120
Cyclohexanone	0.500	0.379		mg/Kg		76	47 - 136
Tetrachloroethene	0.0200	0.0208		mg/Kg		104	73 - 120
Isobutyl alcohol	0.500	0.519		mg/Kg		104	69 - 129
Naphthalene	0.0200	0.0218		mg/Kg		109	48 - 130
Toluene	0.0200	0.0214		mg/Kg		107	80 - 120
n-Butanol	1.00	1.01		mg/Kg		101	63 - 123
trans-1,2-Dichloroethene	0.0200	0.0216		mg/Kg		108	80 - 126
n-Butylbenzene	0.0200	0.0207		mg/Kg		103	71 - 121
trans-1,3-Dichloropropene	0.0200	0.0209		mg/Kg		104	68 - 122
n-Heptane	0.0200	0.0210		mg/Kg		105	50 - 141
Trichloroethene	0.0200	0.0213		mg/Kg		106	80 - 120
Trichlorofluoromethane	0.0200	0.0186		mg/Kg		93	55 - 134
p-Isopropyltoluene	0.0200	0.0219		mg/Kg		109	72 - 120
Vinyl chloride	0.0200	0.0182		mg/Kg		91	52 - 120
sec-Butylbenzene	0.0200	0.0215		mg/Kg		108	72 - 120
t-Butyl alcohol	0.200	0.207		mg/Kg		103	74 - 121
tert-Butylbenzene	0.0200	0.0200		mg/Kg		100	68 - 120
Tetrahydrofuran	0.100	0.104		mg/Kg		104	71 - 127
Xylenes, Total	0.0600	0.0643		mg/Kg		107	75 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*54 - 135*
4-Bromofluorobenzene (Surr)	*100*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*101*		*52 - 141*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69809/7
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Acetonitrile			0.150	0.127		mg/Kg		85	61 - 120		
Chlorodifluoromethane			0.0200	0.0182		mg/Kg		91	60 - 133		
Ethyl acetate			0.0200	0.0237		mg/Kg		118	65 - 133		
Ethyl ether			0.0200	0.0252		mg/Kg		126	59 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*106*		*54 - 135*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*100*		*52 - 141*

Lab Sample ID: LCSD 410-69809/6
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane			0.0200	0.0206		mg/Kg		103	76 - 120	4	30
1,2,4-Trimethylbenzene			0.0200	0.0217		mg/Kg		109	73 - 120	2	30
1,2-Dichloroethane			0.0200	0.0204		mg/Kg		102	71 - 128	5	30
1,2,4-Trichlorobenzene			0.0200	0.0213		mg/Kg		106	56 - 130	3	30
1,4-Dichlorobenzene			0.0200	0.0208		mg/Kg		104	80 - 120	4	30
1,4-Dioxane			0.500	0.498		mg/Kg		100	62 - 131	12	30
4-Methyl-2-pentanone			0.100	0.102		mg/Kg		102	67 - 128	7	30
1,3,5-Trimethylbenzene			0.0200	0.0216		mg/Kg		108	73 - 120	3	30
1,3-Dichlorobenzene			0.0200	0.0207		mg/Kg		103	75 - 120	5	30
2-Hexanone			0.100	0.101		mg/Kg		101	54 - 140	7	30
Acetone			0.150	0.142		mg/Kg		95	41 - 150	0	30
Benzene			0.0200	0.0206		mg/Kg		103	80 - 120	2	30
1,1,1-Trichloroethane			0.0200	0.0208		mg/Kg		104	69 - 123	2	30
Bromomethane			0.0200	0.0210		mg/Kg		105	45 - 140	4	30
Carbon tetrachloride			0.0200	0.0207		mg/Kg		104	64 - 134	2	30
Chlorobenzene			0.0200	0.0208		mg/Kg		104	80 - 120	2	30
Bromochloromethane			0.0200	0.0201		mg/Kg		101	72 - 124	4	30
Chloroethane			0.0200	0.0201		mg/Kg		100	43 - 135	2	30
Chloroform			0.0200	0.0208		mg/Kg		104	80 - 120	4	30
Chloromethane			0.0200	0.0174		mg/Kg		87	56 - 120	2	30
Carbon disulfide			0.0200	0.0208		mg/Kg		104	64 - 133	3	30
cis-1,2-Dichloroethene			0.0200	0.0220		mg/Kg		110	80 - 125	1	30
Bromoform			0.0200	0.0183		mg/Kg		91	51 - 127	7	30
cis-1,3-Dichloropropene			0.0200	0.0201		mg/Kg		101	66 - 120	4	30
Bromodichloromethane			0.0200	0.0204		mg/Kg		102	70 - 120	2	30
Cyclohexane			0.0200	0.0208		mg/Kg		104	58 - 126	0	30
1,1-Dichloroethane			0.0200	0.0210		mg/Kg		105	79 - 120	2	30
1,1-Dichloroethene			0.0200	0.0223		mg/Kg		112	73 - 129	1	30
Dibromochloromethane			0.0200	0.0205		mg/Kg		102	69 - 125	3	30
Dichlorodifluoromethane			0.0200	0.0140		mg/Kg		70	21 - 127	3	30
1,2-Dichloropropane			0.0200	0.0211		mg/Kg		105	80 - 120	3	30
Ethylbenzene			0.0200	0.0212		mg/Kg		106	78 - 120	2	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69809/6
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2-Butanone	0.150	0.144		mg/Kg		96	57 - 128	8	30
Freon 113	0.0200	0.0191		mg/Kg		96	64 - 135	1	30
1,1,2-Trichloroethane	0.0200	0.0211		mg/Kg		106	80 - 120	4	30
2-Nitropropane	0.0200	0.0181		mg/Kg		91	27 - 183	8	30
m&p-Xylene	0.0400	0.0419		mg/Kg		105	80 - 120	3	30
Methyl acetate	0.0200	0.0177		mg/Kg		89	67 - 128	9	30
1,1,2,2-Tetrachloroethane	0.0200	0.0203		mg/Kg		102	69 - 125	7	30
Methyl tertiary butyl ether	0.0200	0.0200		mg/Kg		100	72 - 120	6	30
1,2,3-Trichlorobenzene	0.0200	0.0211		mg/Kg		106	57 - 131	5	30
Methylcyclohexane	0.0200	0.0192		mg/Kg		96	61 - 124	2	30
Methylene Chloride	0.0200	0.0206		mg/Kg		103	76 - 122	1	30
1,2-Dichlorobenzene	0.0200	0.0209		mg/Kg		105	76 - 120	3	30
1,2-Dibromo-3-Chloropropane	0.0200	0.0196		mg/Kg		98	48 - 134	5	30
Isopropylbenzene	0.0200	0.0219		mg/Kg		109	77 - 120	2	30
o-Xylene	0.0200	0.0205		mg/Kg		103	75 - 120	3	30
Styrene	0.0200	0.0201		mg/Kg		101	76 - 120	3	30
Cyclohexanone	0.500	0.354		mg/Kg		71	47 - 136	7	30
Tetrachloroethene	0.0200	0.0205		mg/Kg		102	73 - 120	2	30
Isobutyl alcohol	0.500	0.490		mg/Kg		98	69 - 129	6	30
Naphthalene	0.0200	0.0204		mg/Kg		102	48 - 130	7	30
Toluene	0.0200	0.0206		mg/Kg		103	80 - 120	4	30
n-Butanol	1.00	0.938		mg/Kg		94	63 - 123	7	30
trans-1,2-Dichloroethene	0.0200	0.0212		mg/Kg		106	80 - 126	2	30
n-Butylbenzene	0.0200	0.0203		mg/Kg		101	71 - 121	2	30
trans-1,3-Dichloropropene	0.0200	0.0202		mg/Kg		101	68 - 122	3	30
n-Heptane	0.0200	0.0208		mg/Kg		104	50 - 141	1	30
Trichloroethene	0.0200	0.0209		mg/Kg		104	80 - 120	2	30
Trichlorofluoromethane	0.0200	0.0183		mg/Kg		92	55 - 134	2	30
p-Isopropyltoluene	0.0200	0.0211		mg/Kg		105	72 - 120	4	30
Vinyl chloride	0.0200	0.0181		mg/Kg		91	52 - 120	1	30
sec-Butylbenzene	0.0200	0.0212		mg/Kg		106	72 - 120	2	30
t-Butyl alcohol	0.200	0.194		mg/Kg		97	74 - 121	6	30
tert-Butylbenzene	0.0200	0.0199		mg/Kg		99	68 - 120	0	30
Tetrahydrofuran	0.100	0.101		mg/Kg		101	71 - 127	3	30
Xylenes, Total	0.0600	0.0624		mg/Kg		104	75 - 120	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*54 - 135*
4-Bromofluorobenzene (Surr)	*100*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*100*		*52 - 141*

Lab Sample ID: LCSD 410-69809/8
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetonitrile	0.150	0.144		mg/Kg		96	61 - 120	12	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69809/8
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chlorodifluoromethane			0.0200	0.0229		mg/Kg		115	60 - 133	23	30
Ethyl acetate			0.0200	0.0201		mg/Kg		101	65 - 133	16	30
Ethyl ether			0.0200	0.0240		mg/Kg		120	59 - 135	5	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*54 - 135*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*101*		*52 - 141*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 410-66233/1-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 66233

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.037	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
1,2,4,5-Tetrachlorobenzene	ND		0.037	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2,2'-oxybis[1-chloropropane]	ND		0.043	0.020	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2,3,4,6-Tetrachlorophenol	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2,4,5-Trichlorophenol	ND		0.067	0.030	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2,4,6-Trichlorophenol	ND		0.057	0.027	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2,4-Dichlorophenol	ND		0.043	0.020	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2,4-Dimethylphenol	ND		0.067	0.030	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2,4-Dinitrophenol	ND		1.0	0.33	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2,4-Dinitrotoluene	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2,6-Dinitrotoluene	ND		0.050	0.023	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2-Chloronaphthalene	ND		0.033	0.0067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2-Chlorophenol	ND		0.037	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2-Methylnaphthalene	ND		0.033	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2-Methylphenol	ND		0.067	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2-Nitroaniline	ND		0.050	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
2-Nitrophenol	ND		0.057	0.027	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
3,3'-Dichlorobenzidine	ND		0.33	0.10	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
3-Nitroaniline	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
4,6-Dinitro-2-methylphenol	ND		0.50	0.23	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
4-Bromophenyl-phenylether	ND		0.050	0.023	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
4-Chloro-3-methylphenol	ND		0.050	0.023	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
3,4-Methylphenol	ND		0.050	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
4-Nitroaniline	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
4-Nitrophenol	ND		0.50	0.17	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Acenaphthene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Acenaphthylene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Acetophenone	ND		0.050	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Anthracene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Atrazine	ND		0.43	0.20	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Benzaldehyde	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Benzo[a]anthracene	ND		0.017	0.0067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-66233/1-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 66233

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]pyrene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Benzo[b]fluoranthene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Benzo[g,h,i]perylene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Benzo[k]fluoranthene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Bis(2-chloroethoxy)methane	ND		0.037	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Bis(2-chloroethyl)ether	ND		0.050	0.023	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Bis(2-ethylhexyl) phthalate	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Butylbenzylphthalate	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Caprolactam	ND		0.17	0.033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Carbazole	ND		0.037	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Chrysene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Di-n-butyl phthalate	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Di-n-octyl phthalate	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Dibenz(a,h)anthracene	ND		0.017	0.0067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Dibenzofuran	ND		0.037	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Diethyl phthalate	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Dimethyl phthalate	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Fluoranthene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
4-Chloroaniline	ND		0.17	0.033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Fluorene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
4-Chlorophenyl-phenyl ether	ND		0.043	0.020	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Hexachlorobenzene	ND		0.017	0.0067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Hexachlorobutadiene	ND		0.077	0.037	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Hexachlorocyclopentadiene	ND		0.50	0.20	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Hexachloroethane	ND		0.17	0.033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Indeno[1,2,3-cd]pyrene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Isophorone	ND		0.037	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
N-Nitrosodi-n-propylamine	ND		0.050	0.023	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
N-Nitrosodiphenylamine	ND		0.037	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Naphthalene	ND		0.017	0.0067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Nitrobenzene	ND		0.067	0.027	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Phenanthrene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Aniline	ND		0.50	0.17	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Phenol	ND		0.037	0.017	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Pyrene	ND		0.017	0.0033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Pentachlorophenol	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Benzyl alcohol	ND		0.50	0.17	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Dicyclohexylamine	ND		2.0	0.67	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
n,n'-Dimethylaniline	ND		0.17	0.033	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Pyridine	ND		0.17	0.067	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
Triethylamine	ND		5.0	1.7	mg/Kg		11/16/20 00:40	11/24/20 10:35	1
1,4-Dioxane	ND		0.33	0.10	mg/Kg		11/16/20 00:40	11/24/20 10:35	1

Tentatively Identified Compound	MB *Est. Result*	MB *Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.623*	*T J*	*mg/Kg*		*1.77*		*11/16/20 00:40*	*11/24/20 10:35*	*1*
Furan, 2,5-dimethyl-	*0.200*	*T J N*	*mg/Kg*		*2.27*	*625-86-5*	*11/16/20 00:40*	*11/24/20 10:35*	*1*
Unknown	*0.218*	*T J*	*mg/Kg*		*3.90*		*11/16/20 00:40*	*11/24/20 10:35*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-66233/1-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 66233

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	110	S1+	45 - 108	11/16/20 00:40	11/24/20 10:35	1
Nitrobenzene-d5 (Surr)	65		32 - 97	11/16/20 00:40	11/24/20 10:35	1
2-Fluorophenol (Surr)	71		26 - 96	11/16/20 00:40	11/24/20 10:35	1
2-Fluorobiphenyl (Surr)	75		39 - 100	11/16/20 00:40	11/24/20 10:35	1
2,4,6-Tribromophenol (Surr)	83		13 - 121	11/16/20 00:40	11/24/20 10:35	1
Phenol-d5 (Surr)	71		27 - 104	11/16/20 00:40	11/24/20 10:35	1

Lab Sample ID: LCS 410-66233/2-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 66233

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	1.67	1.33		mg/Kg		80	59 - 106
1,2,4,5-Tetrachlorobenzene	1.67	1.35		mg/Kg		81	60 - 102
2,2'-oxybis[1-chloropropane]	1.67	1.26		mg/Kg		76	44 - 105
2,3,4,6-Tetrachlorophenol	1.67	1.50		mg/Kg		90	66 - 116
2,4,5-Trichlorophenol	1.67	1.51		mg/Kg		91	67 - 110
2,4,6-Trichlorophenol	1.67	1.46		mg/Kg		87	60 - 120
2,4-Dichlorophenol	1.67	1.38		mg/Kg		83	64 - 109
2,4-Dimethylphenol	1.67	1.40		mg/Kg		84	46 - 88
2,4-Dinitrophenol	3.33	2.86		mg/Kg		86	47 - 126
2,4-Dinitrotoluene	1.67	1.44		mg/Kg		87	67 - 115
2,6-Dinitrotoluene	1.67	1.50		mg/Kg		90	67 - 113
2-Chloronaphthalene	1.67	1.38		mg/Kg		83	56 - 112
2-Chlorophenol	1.67	1.30		mg/Kg		78	59 - 97
2-Methylnaphthalene	1.67	1.36		mg/Kg		81	63 - 101
2-Methylphenol	1.67	1.44		mg/Kg		86	56 - 105
2-Nitroaniline	1.67	1.32		mg/Kg		79	63 - 119
2-Nitrophenol	1.67	1.31		mg/Kg		79	55 - 104
3,3'-Dichlorobenzidine	3.33	2.02		mg/Kg		61	40 - 107
3-Nitroaniline	1.67	1.20		mg/Kg		72	59 - 124
4,6-Dinitro-2-methylphenol	3.33	2.78		mg/Kg		83	63 - 126
4-Bromophenyl-phenylether	1.67	1.40		mg/Kg		84	68 - 114
4-Chloro-3-methylphenol	1.67	1.41		mg/Kg		85	62 - 117
3,4-Methylphenol	1.67	1.29		mg/Kg		77	56 - 100
4-Nitroaniline	1.67	1.43		mg/Kg		86	45 - 99
4-Nitrophenol	3.33	2.73		mg/Kg		82	52 - 114
Acenaphthene	1.67	1.39		mg/Kg		84	61 - 104
Acenaphthylene	1.67	1.68		mg/Kg		101	59 - 116
Acetophenone	1.67	1.22		mg/Kg		73	54 - 95
Anthracene	1.67	1.52		mg/Kg		91	75 - 114
Atrazine	1.68	1.68		mg/Kg		100	76 - 120
Benzaldehyde	1.68	0.938		mg/Kg		56	18 - 88
Benzo[a]anthracene	1.67	1.52		mg/Kg		91	73 - 114
Benzo[a]pyrene	1.67	1.45		mg/Kg		87	76 - 113
Benzo[b]fluoranthene	1.67	1.31		mg/Kg		78	73 - 117
Benzo[g,h,i]perylene	1.67	1.46		mg/Kg		87	77 - 114
Benzo[k]fluoranthene	1.67	1.66		mg/Kg		100	66 - 122

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-66233/2-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 66233

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-chloroethoxy)methane	1.67	1.22		mg/Kg		73	53 - 101
Bis(2-chloroethyl)ether	1.67	1.20		mg/Kg		72	49 - 94
Bis(2-ethylhexyl) phthalate	1.67	1.40		mg/Kg		84	62 - 123
Butylbenzylphthalate	1.67	1.37		mg/Kg		82	62 - 123
Caprolactam	1.68	1.34		mg/Kg		80	66 - 109
Carbazole	1.67	1.49		mg/Kg		89	74 - 117
Chrysene	1.67	1.46		mg/Kg		87	66 - 111
Di-n-butyl phthalate	1.67	1.45		mg/Kg		87	70 - 126
Di-n-octyl phthalate	1.67	1.42		mg/Kg		85	60 - 133
Dibenz(a,h)anthracene	1.67	1.47		mg/Kg		88	81 - 121
Dibenzofuran	1.67	1.41		mg/Kg		85	62 - 113
Diethyl phthalate	1.67	1.41		mg/Kg		85	68 - 116
Dimethyl phthalate	1.67	1.39		mg/Kg		83	66 - 113
Fluoranthene	1.67	1.48		mg/Kg		89	65 - 114
4-Chloroaniline	1.67	0.885		mg/Kg		53	38 - 90
Fluorene	1.67	1.38		mg/Kg		83	62 - 110
4-Chlorophenyl-phenyl ether	1.67	1.37		mg/Kg		82	58 - 110
Hexachlorobenzene	1.67	1.42		mg/Kg		85	69 - 116
Hexachlorobutadiene	1.67	1.18		mg/Kg		71	49 - 106
Hexachlorocyclopentadiene	1.67	1.52		mg/Kg		91	19 - 100
Hexachloroethane	1.67	1.12		mg/Kg		67	48 - 86
Indeno[1,2,3-cd]pyrene	1.67	1.51		mg/Kg		90	71 - 122
Isophorone	1.67	1.37		mg/Kg		82	52 - 103
N-Nitrosodi-n-propylamine	1.67	1.29		mg/Kg		78	51 - 100
N-Nitrosodiphenylamine	1.42	1.25		mg/Kg		89	74 - 115
Naphthalene	1.67	1.24		mg/Kg		74	60 - 94
Nitrobenzene	1.67	1.23		mg/Kg		74	50 - 99
Phenanthrene	1.67	1.44		mg/Kg		86	74 - 112
Aniline	1.67	1.12		mg/Kg		67	37 - 77
Phenol	1.67	1.37		mg/Kg		82	54 - 100
Pyrene	1.67	1.42		mg/Kg		85	70 - 103
Pentachlorophenol	3.33	3.09		mg/Kg		93	51 - 121
Benzyl alcohol	1.67	1.37		mg/Kg		82	44 - 109
Pyridine	3.33	1.49		mg/Kg		45	30 - 62
1,4-Dioxane	1.67	0.640		mg/Kg		38	20 - 53

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
p-Terphenyl-d14 (Surr)	*98*		*45 - 108*
Nitrobenzene-d5 (Surr)	*71*		*32 - 97*
2-Fluorophenol (Surr)	*80*		*26 - 96*
2-Fluorobiphenyl (Surr)	*85*		*39 - 100*
2,4,6-Tribromophenol (Surr)	*99*		*13 - 121*
Phenol-d5 (Surr)	*86*		*27 - 104*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-66233/5-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 66233

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dicyclohexylamine			1.67	1.06	J	mg/Kg		63	49 - 141		
n,n'-Dimethylaniline			0.842	0.541		mg/Kg		64	32 - 133		
Triethylamine			1.67	ND	*-	mg/Kg		30	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
p-Terphenyl-d14 (Surr)	*104*		*45 - 108*
Nitrobenzene-d5 (Surr)	*69*		*32 - 97*
2-Fluorophenol (Surr)	*76*		*26 - 96*
2-Fluorobiphenyl (Surr)	*79*		*39 - 100*
2,4,6-Tribromophenol (Surr)	*90*		*13 - 121*
Phenol-d5 (Surr)	*78*		*27 - 104*

Lab Sample ID: LCSD 410-66233/6-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 66233

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dicyclohexylamine			1.67	1.07	J	mg/Kg		64	49 - 141	1	30
n,n'-Dimethylaniline			0.842	0.485		mg/Kg		58	32 - 133	11	30
Triethylamine			1.67	ND	*- *1	mg/Kg		20	70 - 130	39	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
p-Terphenyl-d14 (Surr)	*106*		*45 - 108*
Nitrobenzene-d5 (Surr)	*64*		*32 - 97*
2-Fluorophenol (Surr)	*69*		*26 - 96*
2-Fluorobiphenyl (Surr)	*80*		*39 - 100*
2,4,6-Tribromophenol (Surr)	*92*		*13 - 121*
Phenol-d5 (Surr)	*74*		*27 - 104*

Method: 8315A - Carbonyl Compounds by HPLC

Lab Sample ID: MB 410-66002/1-A
Matrix: Solid
Analysis Batch: 66726

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 66002

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		50	25	ug/Kg		11/14/20 08:33	11/18/20 20:58	1
Formaldehyde	ND		75	25	ug/Kg		11/14/20 08:33	11/18/20 20:58	1
Glutaraldehyde	ND		50	25	ug/Kg		11/14/20 08:33	11/18/20 20:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*123*		*77 - 133*	*11/14/20 08:33*	*11/18/20 20:58*	*1*

Method: 8315A - Carbonyl Compounds by HPLC (Continued)

Lab Sample ID: LCS 410-66002/2-A
Matrix: Solid
Analysis Batch: 66726

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 66002

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Acetaldehyde			499	570		ug/Kg		114	83 - 115		
Formaldehyde			503	482		ug/Kg		96	81 - 120		
Glutaraldehyde			503	535		ug/Kg		106	84 - 123		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Butyraldehyde	*128*		*77 - 133*

Lab Sample ID: 410-20273-1 MS
Matrix: Soil
Analysis Batch: 66726

Client Sample ID: B55-PDI-SB-01 (8-10)
Prep Type: Total/NA
Prep Batch: 66002

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Acetaldehyde	ND	F1	591	673		ug/Kg	☼	114	83 - 115		
Formaldehyde	170		597	724		ug/Kg	☼	93	81 - 120		
Glutaraldehyde	ND		597	652		ug/Kg	☼	109	84 - 123		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Butyraldehyde	*120*		*77 - 133*

Lab Sample ID: 410-20273-1 MSD
Matrix: Soil
Analysis Batch: 66726

Client Sample ID: B55-PDI-SB-01 (8-10)
Prep Type: Total/NA
Prep Batch: 66002

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetaldehyde	ND	F1	591	700	F1	ug/Kg	☼	118	83 - 115	4	50
Formaldehyde	170		597	746		ug/Kg	☼	96	81 - 120	3	50
Glutaraldehyde	ND		597	676		ug/Kg	☼	113	84 - 123	4	50

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Butyraldehyde	*126*		*77 - 133*

GC/MS VOA

Prep Batch: 65466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-1	B55-PDI-SB-01 (8-10)	Total/NA	Soil	5035	
410-20273-1 - DL	B55-PDI-SB-01 (8-10)	Total/NA	Soil	5035	
410-20273-3	B55-PDI-SB-02 (10-12)	Total/NA	Soil	5035	
410-20273-3 - DL	B55-PDI-SB-02 (10-12)	Total/NA	Soil	5035	

Prep Batch: 65467

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-2	B55-PDI-SB-01 (16-16.9)	Total/NA	Soil	5035	

Analysis Batch: 69161

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-1	B55-PDI-SB-01 (8-10)	Total/NA	Soil	8260C	65466
410-20273-1 - DL	B55-PDI-SB-01 (8-10)	Total/NA	Soil	8260C	65466
410-20273-3	B55-PDI-SB-02 (10-12)	Total/NA	Soil	8260C	65466
410-20273-3 - DL	B55-PDI-SB-02 (10-12)	Total/NA	Soil	8260C	65466
MB 410-69161/9	Method Blank	Total/NA	Solid	8260C	
LCS 410-69161/5	Lab Control Sample	Total/NA	Solid	8260C	
LCS 410-69161/7	Lab Control Sample	Total/NA	Solid	8260C	
LCSD 410-69161/6	Lab Control Sample Dup	Total/NA	Solid	8260C	
LCSD 410-69161/8	Lab Control Sample Dup	Total/NA	Solid	8260C	

Analysis Batch: 69809

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-2	B55-PDI-SB-01 (16-16.9)	Total/NA	Soil	8260C	65467
MB 410-69809/10	Method Blank	Total/NA	Solid	8260C	
LCS 410-69809/5	Lab Control Sample	Total/NA	Solid	8260C	
LCS 410-69809/7	Lab Control Sample	Total/NA	Solid	8260C	
LCSD 410-69809/6	Lab Control Sample Dup	Total/NA	Solid	8260C	
LCSD 410-69809/8	Lab Control Sample Dup	Total/NA	Solid	8260C	

GC/MS Semi VOA

Prep Batch: 66233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-1 - DL	B55-PDI-SB-01 (8-10)	Total/NA	Soil	3546	
410-20273-1	B55-PDI-SB-01 (8-10)	Total/NA	Soil	3546	
410-20273-2	B55-PDI-SB-01 (16-16.9)	Total/NA	Soil	3546	
410-20273-2 - DL	B55-PDI-SB-01 (16-16.9)	Total/NA	Soil	3546	
410-20273-3 - DL	B55-PDI-SB-02 (10-12)	Total/NA	Soil	3546	
410-20273-3	B55-PDI-SB-02 (10-12)	Total/NA	Soil	3546	
MB 410-66233/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-66233/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCS 410-66233/5-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 410-66233/6-A	Lab Control Sample Dup	Total/NA	Solid	3546	

Analysis Batch: 69801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-1	B55-PDI-SB-01 (8-10)	Total/NA	Soil	8270D	66233
410-20273-1 - DL	B55-PDI-SB-01 (8-10)	Total/NA	Soil	8270D	66233
410-20273-2	B55-PDI-SB-01 (16-16.9)	Total/NA	Soil	8270D	66233
410-20273-2 - DL	B55-PDI-SB-01 (16-16.9)	Total/NA	Soil	8270D	66233

GC/MS Semi VOA (Continued)

Analysis Batch: 69801 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-3	B55-PDI-SB-02 (10-12)	Total/NA	Soil	8270D	66233
MB 410-66233/1-A	Method Blank	Total/NA	Solid	8270D	66233
LCS 410-66233/2-A	Lab Control Sample	Total/NA	Solid	8270D	66233
LCS 410-66233/5-A	Lab Control Sample	Total/NA	Solid	8270D	66233
LCSD 410-66233/6-A	Lab Control Sample Dup	Total/NA	Solid	8270D	66233

Analysis Batch: 70671

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-3 - DL	B55-PDI-SB-02 (10-12)	Total/NA	Soil	8270D	66233

HPLC/IC

Prep Batch: 66002

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-1	B55-PDI-SB-01 (8-10)	Total/NA	Soil	8315A Prep	
410-20273-2	B55-PDI-SB-01 (16-16.9)	Total/NA	Soil	8315A Prep	
410-20273-3	B55-PDI-SB-02 (10-12)	Total/NA	Soil	8315A Prep	
MB 410-66002/1-A	Method Blank	Total/NA	Solid	8315A Prep	
LCS 410-66002/2-A	Lab Control Sample	Total/NA	Solid	8315A Prep	
410-20273-1 MS	B55-PDI-SB-01 (8-10)	Total/NA	Soil	8315A Prep	
410-20273-1 MSD	B55-PDI-SB-01 (8-10)	Total/NA	Soil	8315A Prep	

Analysis Batch: 66726

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-1	B55-PDI-SB-01 (8-10)	Total/NA	Soil	8315A	66002
410-20273-2	B55-PDI-SB-01 (16-16.9)	Total/NA	Soil	8315A	66002
410-20273-3	B55-PDI-SB-02 (10-12)	Total/NA	Soil	8315A	66002
MB 410-66002/1-A	Method Blank	Total/NA	Solid	8315A	66002
LCS 410-66002/2-A	Lab Control Sample	Total/NA	Solid	8315A	66002
410-20273-1 MS	B55-PDI-SB-01 (8-10)	Total/NA	Soil	8315A	66002
410-20273-1 MSD	B55-PDI-SB-01 (8-10)	Total/NA	Soil	8315A	66002

General Chemistry

Analysis Batch: 65459

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20273-1	B55-PDI-SB-01 (8-10)	Total/NA	Soil	Moisture	
410-20273-2	B55-PDI-SB-01 (16-16.9)	Total/NA	Soil	Moisture	
410-20273-3	B55-PDI-SB-02 (10-12)	Total/NA	Soil	Moisture	

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Client Sample ID: B55-PDI-SB-01 (8-10)
Date Collected: 11/10/20 10:35
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-1
Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	65459	11/12/20 21:26	OEL4	ELLE

Client Sample ID: B55-PDI-SB-01 (8-10)
Date Collected: 11/10/20 10:35
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-1
Matrix: Soil
Percent Solids: 84.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			65466	11/12/20 22:07	UK3O	ELLE
Total/NA	Analysis	8260C		200	69161	11/23/20 01:19	Z6JB	ELLE
Total/NA	Prep	5035	DL		65466	11/12/20 22:07	UK3O	ELLE
Total/NA	Analysis	8260C	DL	2000	69161	11/23/20 01:40	Z6JB	ELLE
Total/NA	Prep	3546			66233	11/16/20 00:40	USL7	ELLE
Total/NA	Analysis	8270D		1	69801	11/24/20 13:49	WKV3	ELLE
Total/NA	Prep	3546	DL		66233	11/16/20 00:40	USL7	ELLE
Total/NA	Analysis	8270D	DL	5	69801	11/24/20 17:22	WKV3	ELLE
Total/NA	Prep	8315A Prep			66002	11/14/20 08:33	QTH7	ELLE
Total/NA	Analysis	8315A		1	66726	11/18/20 21:44	GM5C	ELLE

Client Sample ID: B55-PDI-SB-01 (16-16.9)
Date Collected: 11/10/20 10:30
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-2
Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	65459	11/12/20 21:26	OEL4	ELLE

Client Sample ID: B55-PDI-SB-01 (16-16.9)
Date Collected: 11/10/20 10:30
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-2
Matrix: Soil
Percent Solids: 87.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			65467	11/12/20 22:24	UK3O	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 14:27	Z6JB	ELLE
Total/NA	Prep	3546			66233	11/16/20 00:40	USL7	ELLE
Total/NA	Analysis	8270D		1	69801	11/24/20 14:14	WKV3	ELLE
Total/NA	Prep	3546	DL		66233	11/16/20 00:40	USL7	ELLE
Total/NA	Analysis	8270D	DL	2	69801	11/24/20 17:45	WKV3	ELLE
Total/NA	Prep	8315A Prep			66002	11/14/20 08:33	QTH7	ELLE
Total/NA	Analysis	8315A		1	66726	11/18/20 21:56	GM5C	ELLE

Client Sample ID: B55-PDI-SB-02 (10-12)
Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3
Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	65459	11/12/20 21:26	OEL4	ELLE

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Client Sample ID: B55-PDI-SB-02 (10-12)

Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3

Matrix: Soil
Percent Solids: 85.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			65466	11/12/20 22:07	UK3O	ELLE
Total/NA	Analysis	8260C		50	69161	11/23/20 02:01	Z6JB	ELLE
Total/NA	Prep	5035	DL		65466	11/12/20 22:07	UK3O	ELLE
Total/NA	Analysis	8260C	DL	500	69161	11/23/20 02:22	Z6JB	ELLE
Total/NA	Prep	3546			66233	11/16/20 00:40	USL7	ELLE
Total/NA	Analysis	8270D		1	69801	11/24/20 14:38	WKV3	ELLE
Total/NA	Prep	3546	DL		66233	11/16/20 00:40	USL7	ELLE
Total/NA	Analysis	8270D	DL	3	70671	11/26/20 16:33	ULM3	ELLE
Total/NA	Prep	8315A Prep			66002	11/14/20 08:33	QTH7	ELLE
Total/NA	Analysis	8315A		1	66726	11/18/20 22:08	GM5C	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Job ID: 410-20273-1
Project/Site: Bristol-Myers Squibb

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New York	NELAP	10670	04-01-21

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8260C	5035	Soil	Chlorodifluoromethane
8260C	5035	Soil	Cyclohexanone
8260C	5035	Soil	Ethyl ether
8260C	5035	Soil	n-Heptane
8260C	5035	Soil	Tetrahydrofuran
8270D	3546	Soil	Dicyclohexylamine
8270D	3546	Soil	n,n'-Dimethylaniline
8270D	3546	Soil	Triethylamine
8315A	8315A Prep	Soil	Acetaldehyde
8315A	8315A Prep	Soil	Glutaraldehyde
Moisture		Soil	Percent Moisture

Method Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	ELLE
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	ELLE
8315A	Carbonyl Compounds by HPLC	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3546	Microwave Extraction	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE
8315A Prep	Extraction (Carbonyl Compounds)	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-20273-1	B55-PDI-SB-01 (8-10)	Soil	11/10/20 10:35	11/11/20 11:00	
410-20273-2	B55-PDI-SB-01 (16-16.9)	Soil	11/10/20 10:30	11/11/20 11:00	
410-20273-3	B55-PDI-SB-02 (10-12)	Soil	11/10/20 09:55	11/11/20 11:00	

Environmental Analysis R ustody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-20273 Chain of Custody

ntal use only _____

COC # 616402

Client Information

Client: Arcadis	Acct. #:
Project Name/#: Bristol-Myers Squibb	PWSID #:
Project Manager: William McClune	P.O. #:
Sampler: Joshua Miller	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☐

Matrix

Soil ☒ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: _____

Analysis Requested

Preservation and Filtration Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	Short-list Aldehydes (Silica)	SVOA 8270D/E (Microwave)	VOCs-Solid by 8260 C/D
B55-PDI-SB-01 (8-10)	11/10/20	1035		X	5	X	X	X
B55-PDI-SB-01 (16-16.7)	11/10/20	1030		X	5	X	X	X
B55-PDI-SB-02 (10-12)	11/10/20	0955		X	5	X	X	X

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

For Lab Use Only
FSC: _____
SCR#: _____

Preservation Codes

H=HCl	T=Thiosulfate
N=HNO_3	B=NaOH
S=H_2SO_4	P=H_3PO_4
F=Field Filtered	O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: Standard

E-mail address: William.McClune@arcadis.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

	Date	Time		Date	Time
Relinquished by	11/10/20	1500	Received by		
Relinquished by			Received by		
Relinquished by			Received by		
Relinquished by			Received by		
Relinquished by			Received by	11/11/20	1100

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx ✓ Other _____

Temperature upon receipt 1.2 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • FOR HELP COMPLETING FORM CHECK OUT https://www.eurofinsus.com/coc

The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919

Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 410-20273-1

Login Number: 20273
List Number: 1
Creator: Rivera-Santa, Julissa

List Source: Eurofins Lancaster Laboratories Env

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-20914-1
Client Project/Site: Bristol-Myers Squibb
Revision: 1

For:
ARCADIS U.S. Inc
One Lincoln Center
110 West Fayette St, Suite 300
Syracuse, New York 13202

Attn: William T McCune

Authorized for release by:
12/30/2020 4:54:00 PM

Megan Moeller, Client Services Group Leader
(717)556-7261
Megan.Moeller@eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

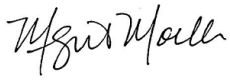
Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



Megan Moeller
Client Services Group Leader
12/30/2020 4:54:00 PM

Table of Contents

Cover Page 1
Table of Contents 3
Definitions/Glossary 4
Case Narrative 6
Detection Summary 8
Client Sample Results 10
Surrogate Summary 35
QC Sample Results 38
QC Association Summary 59
Lab Chronicle 62
Certification Summary 65
Method Summary 66
Sample Summary 67
Chain of Custody 68
Receipt Checklists 69

Definitions/Glossary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*+	LCS and/or LCSD is outside acceptance limits, high biased.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-20914-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-20914-1

Revision
The report being provided is a revision of the original report sent on 12/11/2020. The report (revision 1) is being revised due to: Add 1,4-Dioxane

Receipt
The samples were received on 11/14/2020 10:05 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

Receipt Exceptions
The following sample has VOCs listed on the COC but no VOC containers were received. EB11132020 (410-20914-5)

The following sample(s) was listed on the Chain of Custody (COC); however, no sample(s) was received: TB20083

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): B55-PDI-11 (5-6) (410-20914-4). The container labels list a collection time of 09:35, while the COC lists a time of 09:30.

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): B55-PDI-SB-15 (8-9) (410-20914-6). The container labels list a collection time of 13:15, while the COC does not list a collection time.

GC/MS VOA
Method 8260C: The continuing calibration verification (CCV) associated with batch 410-69161 recovered outside acceptance criteria, low biased, for 2-Butanone and Chloromethane. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: The continuing calibration verification (CCV) associated with batch 410-69161 recovered above the upper control limit for 2-Nitropropane and Bromoform. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: The continuing calibration verification (CCV) associated with batch 410-69809 recovered above the upper control limit for 1,4-Dioxane. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: Surrogate recovery for the following sample in analytical batch 410-69809 was outside control limits: B55-PDI-13 (12-12.5) (410-20914-2). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270D: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 410-67649 recovered outside control limits for the following analytes: Triethylamine. The stated control limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Method 8270D: A surrogate recovery for the method blank (MB) associated with preparation batch 410-67649 was outside the upper control limits. The MB did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

HPLC/IC
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep

Job ID: 410-20914-1 (Continued)

Laboratory: Eurofins Lancaster Laboratories Env, LLC (Conti

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Client Sample ID: B55-PDI-13 (6-8) — Lab Sample ID: 410-20914-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	0.12	J	0.25	0.025	mg/Kg	50	☼	8260C	Total/NA
n-Butylbenzene	0.33	J	0.40	0.15	mg/Kg	50	☼	8260C	Total/NA
Anthracene	0.0079	J	0.020	0.0040	mg/Kg	1	☼	8270D	Total/NA
Phenanthrene	0.0071	J	0.020	0.0040	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.017	J	0.020	0.0040	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	43		24	8.0	mg/Kg	10	☼	8270D	Total/NA
Acetaldehyde	0.058	J	0.060	0.030	mg/Kg	1	☼	8315A	Total/NA
Formaldehyde - DL	1.4	F1	0.45	0.15	mg/Kg	5	☼	8315A	Total/NA

Client Sample ID: B55-PDI-13 (12-12.5) — Lab Sample ID: 410-20914-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	0.095		0.0034	0.00034	mg/Kg	1	☼	8260C	Total/NA
2-Butanone	0.013		0.0069	0.0014	mg/Kg	1	☼	8260C	Total/NA
Acetone	0.019		0.014	0.0041	mg/Kg	1	☼	8260C	Total/NA
Carbon disulfide	0.0036		0.0034	0.00041	mg/Kg	1	☼	8260C	Total/NA
Cyclohexanone	0.44		0.17	0.017	mg/Kg	1	☼	8260C	Total/NA
Isopropylbenzene	0.0025	J	0.0034	0.00028	mg/Kg	1	☼	8260C	Total/NA
Methylcyclohexane	0.021		0.0034	0.00041	mg/Kg	1	☼	8260C	Total/NA
Naphthalene	0.0021	J	0.0034	0.0014	mg/Kg	1	☼	8260C	Total/NA
n-Butylbenzene	0.021		0.0055	0.0021	mg/Kg	1	☼	8260C	Total/NA
o-Xylene	0.00030	J	0.0034	0.00028	mg/Kg	1	☼	8260C	Total/NA
p-Isopropyltoluene	0.011		0.0034	0.0014	mg/Kg	1	☼	8260C	Total/NA
sec-Butylbenzene	0.0090		0.0034	0.0014	mg/Kg	1	☼	8260C	Total/NA
Anthracene	0.0060	J	0.018	0.0036	mg/Kg	1	☼	8270D	Total/NA
Benzo[a]anthracene	0.019		0.018	0.0073	mg/Kg	1	☼	8270D	Total/NA
Benzo[a]pyrene	0.016	J	0.018	0.0036	mg/Kg	1	☼	8270D	Total/NA
Benzo[b]fluoranthene	0.017	J	0.018	0.0036	mg/Kg	1	☼	8270D	Total/NA
Benzo[g,h,i]perylene	0.0050	J	0.018	0.0036	mg/Kg	1	☼	8270D	Total/NA
Benzo[k]fluoranthene	0.010	J	0.018	0.0036	mg/Kg	1	☼	8270D	Total/NA
Bis(2-ethylhexyl) phthalate	0.17	J	0.18	0.073	mg/Kg	1	☼	8270D	Total/NA
Chrysene	0.014	J	0.018	0.0036	mg/Kg	1	☼	8270D	Total/NA
Fluoranthene	0.039		0.018	0.0036	mg/Kg	1	☼	8270D	Total/NA
Indeno[1,2,3-cd]pyrene	0.0055	J	0.018	0.0036	mg/Kg	1	☼	8270D	Total/NA
Phenanthrene	0.018		0.018	0.0036	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.040		0.018	0.0036	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	4.9		4.4	1.5	mg/Kg	2	☼	8270D	Total/NA
Formaldehyde	0.12		0.083	0.028	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-07 (13-14) — Lab Sample ID: 410-20914-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	0.00040	J	0.0040	0.00040	mg/Kg	1	☼	8260C	Total/NA
2-Butanone	0.0050	J	0.0079	0.0016	mg/Kg	1	☼	8260C	Total/NA
Acetone	0.027		0.016	0.0048	mg/Kg	1	☼	8260C	Total/NA
Carbon disulfide	0.00079	J	0.0040	0.00048	mg/Kg	1	☼	8260C	Total/NA
Cyclohexane	0.027		0.0040	0.00040	mg/Kg	1	☼	8260C	Total/NA
Cyclohexanone	0.033	J	0.20	0.020	mg/Kg	1	☼	8260C	Total/NA
Ethylbenzene	0.017		0.0040	0.00032	mg/Kg	1	☼	8260C	Total/NA
Isopropylbenzene	0.0063		0.0040	0.00032	mg/Kg	1	☼	8260C	Total/NA
m&p-Xylene	0.0060		0.0040	0.00079	mg/Kg	1	☼	8260C	Total/NA
Methylcyclohexane	0.0060		0.0040	0.00048	mg/Kg	1	☼	8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: B55-PDI-07 (13-14) (Continued) — Lab Sample ID: 410-20914-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	0.0061		0.0040	0.0016	mg/Kg	1	☼	8260C	Total/NA
n-Butylbenzene	0.0027	J	0.0064	0.0024	mg/Kg	1	☼	8260C	Total/NA
o-Xylene	0.0033	J	0.0040	0.00032	mg/Kg	1	☼	8260C	Total/NA
Toluene	0.00060	J	0.0040	0.00048	mg/Kg	1	☼	8260C	Total/NA
Xylenes, Total	0.0093		0.0079	0.0011	mg/Kg	1	☼	8260C	Total/NA
Acenaphthylene	0.042		0.021	0.0041	mg/Kg	1	☼	8270D	Total/NA
Naphthalene	0.0088	J	0.021	0.0082	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	18		12	4.1	mg/Kg	5	☼	8270D	Total/NA
Acetaldehyde	0.048	J	0.062	0.031	mg/Kg	1	☼	8315A	Total/NA
Formaldehyde	0.27		0.093	0.031	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-11 (5-6) — Lab Sample ID: 410-20914-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.12	J	0.26	0.021	mg/Kg	50	☼	8260C	Total/NA
1,2,4-Trimethylbenzene	2.9		0.26	0.026	mg/Kg	50	☼	8260C	Total/NA
m&p-Xylene	0.059	J	0.26	0.052	mg/Kg	50	☼	8260C	Total/NA
Isopropylbenzene	0.23	J	0.26	0.021	mg/Kg	50	☼	8260C	Total/NA
n-Butylbenzene	1.7		0.42	0.16	mg/Kg	50	☼	8260C	Total/NA
p-Isopropyltoluene	0.43		0.26	0.10	mg/Kg	50	☼	8260C	Total/NA
sec-Butylbenzene	0.71		0.26	0.10	mg/Kg	50	☼	8260C	Total/NA
Phenanthrene	0.0086	J	0.019	0.0039	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.0069	J	0.019	0.0039	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine	1.7	J	2.3	0.77	mg/Kg	1	☼	8270D	Total/NA
Formaldehyde	0.47		0.089	0.030	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: EB11132020 — Lab Sample ID: 410-20914-5

No Detections.

Client Sample ID: B55-PDI-SB-15 (8-9) — Lab Sample ID: 410-20914-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone	0.0038	J	0.0079	0.0016	mg/Kg	1	☼	8260C	Total/NA
Acetone	0.080		0.016	0.0047	mg/Kg	1	☼	8260C	Total/NA
Carbon disulfide	0.00098	J	0.0040	0.00047	mg/Kg	1	☼	8260C	Total/NA
Cyclohexanone	2.2		0.20	0.020	mg/Kg	1	☼	8260C	Total/NA
Naphthalene	0.0021	J	0.0040	0.0016	mg/Kg	1	☼	8260C	Total/NA
t-Butyl alcohol	0.044	J	0.079	0.012	mg/Kg	1	☼	8260C	Total/NA
Benzo[a]pyrene	0.0061	J	0.020	0.0040	mg/Kg	1	☼	8270D	Total/NA
Benzo[b]fluoranthene	0.0058	J	0.020	0.0040	mg/Kg	1	☼	8270D	Total/NA
Chrysene	0.0052	J	0.020	0.0040	mg/Kg	1	☼	8270D	Total/NA
Fluoranthene	0.013	J	0.020	0.0040	mg/Kg	1	☼	8270D	Total/NA
Phenanthrene	0.0040	J	0.020	0.0040	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.0099	J	0.020	0.0040	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	5.0		4.8	1.6	mg/Kg	2	☼	8270D	Total/NA
Acetaldehyde	0.059	J	0.060	0.030	mg/Kg	1	☼	8315A	Total/NA
Formaldehyde	0.39		0.090	0.030	mg/Kg	1	☼	8315A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: B55-PDI-13 (6-8)
Date Collected: 11/13/20 08:40
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-1
Matrix: Soil
Percent Solids: 83.1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
trans-1,3-Dichloropropene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Ethylbenzene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Styrene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,4-Dichlorobenzene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2-Dibromoethane	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2-Dichloroethane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
4-Methyl-2-pentanone	ND		0.50	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Methylcyclohexane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Toluene	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Chlorobenzene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2,4-Trimethylbenzene	**0.12**	**J**	0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Cyclohexane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2,4-Trichlorobenzene	ND		0.50	0.25	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,4-Dioxane	ND		13	1.9	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Dibromochloromethane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Tetrachloroethene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
cis-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
trans-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Methyl tertiary butyl ether	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
m&p-Xylene	ND		0.25	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,3,5-Trimethylbenzene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,3-Dichlorobenzene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Carbon tetrachloride	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
2-Hexanone	ND		0.50	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Acetone	ND		1.0	0.30	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Chloroform	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Benzene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,1,1-Trichloroethane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Bromomethane	ND		0.25	0.035	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Chloromethane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Bromochloromethane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Chloroethane	ND		0.25	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Vinyl chloride	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Methylene Chloride	ND		0.25	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Carbon disulfide	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Bromoform	ND	*	0.50	0.25	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Bromodichloromethane	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,1-Dichloroethane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,1-Dichloroethene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Trichlorofluoromethane	ND		0.25	0.035	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Dichlorodifluoromethane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Freon 113	ND		0.50	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2-Dichloropropane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
2-Butanone	ND		0.50	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,1,2-Trichloroethane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
2-Nitropropane	ND	*	0.50	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Trichloroethene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Methyl acetate	ND		0.25	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50

Client Sample ID: B55-PDI-13 (6-8)

Date Collected: 11/13/20 08:40
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-1

Matrix: Soil
Percent Solids: 83.1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2,3-Trichlorobenzene	ND		0.50	0.25	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
o-Xylene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2-Dichlorobenzene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2-Dibromo-3-Chloropropane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Acetonitrile	ND		5.0	1.3	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Isopropylbenzene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Chlorodifluoromethane	ND		0.50	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Cyclohexanone	ND		13	1.3	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Ethyl acetate	ND		0.25	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Ethyl ether	ND		0.25	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Isobutyl alcohol	ND		13	1.9	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Naphthalene	ND		0.25	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
n-Butanol	ND		13	2.8	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
n-Butylbenzene	**0.33**	**J**	0.40	0.15	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
n-Heptane	ND		0.40	0.15	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
p-Isopropyltoluene	ND		0.25	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
sec-Butylbenzene	ND		0.25	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
t-Butyl alcohol	ND		5.0	0.76	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
tert-Butylbenzene	ND		0.25	0.040	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Tetrahydrofuran	ND		0.40	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Xylenes, Total	ND		0.50	0.071	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Pentane, 2,4-dimethyl-	*5.8*	*T J N*	*mg/Kg*	☼	*6.06*	*108-08-7*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Pentane, 2,3-dimethyl-	*12*	*T J N*	*mg/Kg*	☼	*7.19*	*565-59-3*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Unknown	*6.6*	*T J*	*mg/Kg*	☼	*7.68*		*11/14/20 16:23*	*11/23/20 02:42*	*50*
Hexane, 2,5-dimethyl-	*10*	*T J N*	*mg/Kg*	☼	*8.67*	*592-13-2*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Hexane, 2,4-dimethyl-	*6.3*	*T J N*	*mg/Kg*	☼	*8.74*	*589-43-5*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Cyclopentane, 1,2,4-trimethyl-	*9.4*	*T J N*	*mg/Kg*	☼	*9.03*	*2815-58-9*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Unknown	*5.0*	*T J*	*mg/Kg*	☼	*9.22*		*11/14/20 16:23*	*11/23/20 02:42*	*50*
Unknown	*6.0*	*T J*	*mg/Kg*	☼	*9.39*		*11/14/20 16:23*	*11/23/20 02:42*	*50*
2-Hexene, 3,5-dimethyl-	*3.9*	*T J N*	*mg/Kg*	☼	*9.50*	*3404-79-3*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Unknown	*4.4*	*T J*	*mg/Kg*	☼	*9.61*		*11/14/20 16:23*	*11/23/20 02:42*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*54 - 135*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
4-Bromofluorobenzene (Surr)	*124*		*50 - 131*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Toluene-d8 (Surr)	*104*		*52 - 141*	*11/14/20 16:23*	*11/23/20 02:42*	*50*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
1,2,4,5-Tetrachlorobenzene	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,2'-oxybis[1-chloropropane]	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4,5-Trichlorophenol	ND		0.080	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4,6-Trichlorophenol	ND		0.068	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4-Dichlorophenol	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Client Sample ID: B55-PDI-13 (6-8)
Date Collected: 11/13/20 08:40
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-1
Matrix: Soil
Percent Solids: 83.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dimethylphenol	ND		0.080	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4-Dinitrophenol	ND		1.2	0.40	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4-Dinitrotoluene	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,6-Dinitrotoluene	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Chloronaphthalene	ND		0.040	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Chlorophenol	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Methylnaphthalene	ND		0.040	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Methylphenol	ND		0.080	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Nitroaniline	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Nitrophenol	ND		0.068	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
3,3'-Dichlorobenzidine	ND		0.40	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
3-Nitroaniline	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4,6-Dinitro-2-methylphenol	ND		0.60	0.28	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Bromophenyl-phenylether	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Chloro-3-methylphenol	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
3,4-Methylphenol	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Nitroaniline	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Nitrophenol	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Acenaphthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Acenaphthylene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Acetophenone	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Anthracene	**0.0079**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Atrazine	ND		0.52	0.24	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzaldehyde	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzo[a]anthracene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzo[a]pyrene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzo[b]fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzo[g,h,i]perylene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzo[k]fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Bis(2-chloroethoxy)methane	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Bis(2-chloroethyl)ether	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Butylbenzylphthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Caprolactam	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Carbazole	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Chrysene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Di-n-butyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Di-n-octyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Dibenz(a,h)anthracene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Dibenzofuran	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Diethyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Dimethyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Chloroaniline	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Fluorene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Chlorophenyl-phenyl ether	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Hexachlorobenzene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Hexachlorobutadiene	ND		0.092	0.044	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Hexachlorocyclopentadiene	ND		0.60	0.24	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1

Client Sample ID: B55-PDI-13 (6-8)
Date Collected: 11/13/20 08:40
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-1
Matrix: Soil
Percent Solids: 83.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachloroethane	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Isophorone	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
N-Nitrosodi-n-propylamine	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
N-Nitrosodiphenylamine	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Naphthalene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Nitrobenzene	ND		0.080	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Phenanthrene	**0.0071**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Aniline	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Phenol	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Pyrene	**0.017**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Pentachlorophenol	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzyl alcohol	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
n,n'-Dimethylaniline	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Pyridine	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Triethylamine	ND	*-	6.0	2.0	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
1,4-Dioxane	ND		0.40	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.6*	*T J B*	*mg/Kg*	☼	*1.78*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.34*	*T J*	*mg/Kg*	☼	*3.25*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.92*	*T J B*	*mg/Kg*	☼	*3.90*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.51*	*T J*	*mg/Kg*	☼	*4.63*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.40*	*T J*	*mg/Kg*	☼	*4.76*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.54*	*T J*	*mg/Kg*	☼	*4.81*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Nonane, 3-methyl-	*0.58*	*T J N*	*mg/Kg*	☼	*4.85*	*5911-04-6*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.36*	*T J*	*mg/Kg*	☼	*5.03*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.56*	*T J*	*mg/Kg*	☼	*5.09*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.49*	*T J*	*mg/Kg*	☼	*5.68*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Benzene, 1-methyl-4-(1-methylethyl)-	*0.62*	*T J N*	*mg/Kg*	☼	*6.41*	*99-87-6*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.73*	*T J*	*mg/Kg*	☼	*6.57*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.80*	*T J*	*mg/Kg*	☼	*6.62*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Benzene, 1-methyl-4-(1-methylpropyl)-	*1.1*	*T J N*	*mg/Kg*	☼	*6.67*	*1595-16-0*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Benzene, pentamethyl-	*0.61*	*T J N*	*mg/Kg*	☼	*6.81*	*700-12-9*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.73*	*T J*	*mg/Kg*	☼	*6.88*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.36*	*T J*	*mg/Kg*	☼	*6.94*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.34*	*T J*	*mg/Kg*	☼	*7.11*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.64*	*T J*	*mg/Kg*	☼	*7.24*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Benzene, 1-(1-methylethenyl)-3-(1-methylethyl)-	*0.50*	*T J N*	*mg/Kg*	☼	*7.40*	*1129-29-9*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.38*	*T J*	*mg/Kg*	☼	*7.60*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*8.0*	*T J*	*mg/Kg*	☼	*8.23*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.43*	*T J N*	*mg/Kg*	☼	*8.63*	*7560-83-0*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.64*	*T J*	*mg/Kg*	☼	*8.91*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Cyclic octaatomic sulfur	*3.5*	*T J N*	*mg/Kg*	☼	*11.18*	*10544-50-0*	*11/18/20 16:18*	*11/24/20 15:02*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*105*		*45 - 108*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Nitrobenzene-d5 (Surr)	*77*		*32 - 97*	*11/18/20 16:18*	*11/24/20 15:02*	*1*

Client Sample ID: B55-PDI-13 (6-8)

Date Collected: 11/13/20 08:40
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-1

Matrix: Soil
Percent Solids: 83.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*88*		*26 - 96*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
2-Fluorobiphenyl (Surr)	*88*		*39 - 100*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
2,4,6-Tribromophenol (Surr)	*92*		*13 - 121*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Phenol-d5 (Surr)	*95*		*27 - 104*	*11/18/20 16:18*	*11/24/20 15:02*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**43**		24	8.0	mg/Kg	☼	11/18/20 16:18	11/25/20 18:24	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*88*		*45 - 108*	*11/18/20 16:18*	*11/25/20 18:24*	*10*
Nitrobenzene-d5 (Surr)	*67*		*32 - 97*	*11/18/20 16:18*	*11/25/20 18:24*	*10*
2-Fluorophenol (Surr)	*77*		*26 - 96*	*11/18/20 16:18*	*11/25/20 18:24*	*10*
2-Fluorobiphenyl (Surr)	*77*		*39 - 100*	*11/18/20 16:18*	*11/25/20 18:24*	*10*
2,4,6-Tribromophenol (Surr)	*69*		*13 - 121*	*11/18/20 16:18*	*11/25/20 18:24*	*10*
Phenol-d5 (Surr)	*80*		*27 - 104*	*11/18/20 16:18*	*11/25/20 18:24*	*10*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	**0.058**	**J**	0.060	0.030	mg/Kg	☼	11/17/20 17:30	11/18/20 23:17	1
Glutaraldehyde	ND		0.060	0.030	mg/Kg	☼	11/17/20 17:30	11/18/20 23:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*112*		*77 - 133*	*11/17/20 17:30*	*11/18/20 23:17*	*1*

Method: 8315A - Carbonyl Compounds by HPLC - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	**1.4**	**F1**	0.45	0.15	mg/Kg	☼	11/17/20 17:30	11/19/20 16:50	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*108*		*77 - 133*	*11/17/20 17:30*	*11/19/20 16:50*	*5*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**16.9**		1.0	1.0	%			11/16/20 20:10	1

Client Sample ID: B55-PDI-13 (12-12.5)

Date Collected: 11/13/20 09:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-2

Matrix: Soil
Percent Solids: 90.6

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,1,2,2-Tetrachloroethane	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,1,2-Trichloroethane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,1-Dichloroethane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,1-Dichloroethene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2,3-Trichlorobenzene	ND		0.0069	0.0034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2,4-Trichlorobenzene	ND		0.0069	0.0034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2,4-Trimethylbenzene	**0.095**		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2-Dibromo-3-Chloropropane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1

Client Sample ID: B55-PDI-13 (12-12.5)
Date Collected: 11/13/20 09:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-2
Matrix: Soil
Percent Solids: 90.6

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2-Dichlorobenzene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2-Dichloroethane	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2-Dichloropropane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,3,5-Trimethylbenzene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,3-Dichlorobenzene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,4-Dichlorobenzene	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,4-Dioxane	ND		0.17	0.025	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
2-Butanone	**0.013**		0.0069	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
2-Hexanone	ND		0.0069	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
2-Nitropropane	ND		0.0069	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
4-Methyl-2-pentanone	ND		0.0069	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Acetone	**0.019**		0.014	0.0041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Acetonitrile	ND		0.069	0.017	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Benzene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Bromochloromethane	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Bromodichloromethane	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Bromoform	ND		0.0069	0.0034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Bromomethane	ND		0.0034	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Carbon disulfide	**0.0036**		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Carbon tetrachloride	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Chlorobenzene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Chlorodifluoromethane	ND		0.0069	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Chloroethane	ND		0.0034	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Chloroform	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Chloromethane	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
cis-1,2-Dichloroethene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
cis-1,3-Dichloropropene	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Cyclohexane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Cyclohexanone	**0.44**		0.17	0.017	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Dibromochloromethane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Dichlorodifluoromethane	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Ethyl acetate	ND		0.0034	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Ethyl ether	ND		0.0034	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Ethylbenzene	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Freon 113	ND		0.0069	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Isobutyl alcohol	ND		0.17	0.026	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Isopropylbenzene	**0.0025**	**J**	0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
m&p-Xylene	ND		0.0034	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Methyl acetate	ND		0.0034	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Methyl tertiary butyl ether	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Methylcyclohexane	**0.021**		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Methylene Chloride	ND		0.0034	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Naphthalene	**0.0021**	**J**	0.0034	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
n-Butanol	ND		0.17	0.039	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
n-Butylbenzene	**0.021**		0.0055	0.0021	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
n-Heptane	ND		0.0055	0.0021	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
o-Xylene	**0.00030**	**J**	0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
p-Isopropyltoluene	**0.011**		0.0034	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1

Client Sample ID: B55-PDI-13 (12-12.5)

Date Collected: 11/13/20 09:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-2

Matrix: Soil
Percent Solids: 90.6

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
sec-Butylbenzene	**0.0090**		0.0034	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Styrene	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
t-Butyl alcohol	ND		0.069	0.010	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
tert-Butylbenzene	ND		0.0034	0.00055	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Tetrachloroethene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Tetrahydrofuran	ND		0.0055	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Toluene	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
trans-1,2-Dichloroethene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
trans-1,3-Dichloropropene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Trichloroethene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Trichlorofluoromethane	ND		0.0034	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Vinyl chloride	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Xylenes, Total	ND		0.0069	0.00096	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Pentane, 2,3-dimethyl-	*0.090*	*T J N*	*mg/Kg*	☼	*4.85*	*565-59-3*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Unknown	*0.11*	*T J*	*mg/Kg*	☼	*5.21*		*11/14/20 16:21*	*11/24/20 14:49*	*1*
Hexane, 2,5-dimethyl-	*0.091*	*T J N*	*mg/Kg*	☼	*6.00*	*592-13-2*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Hexane, 2,4-dimethyl-	*0.087*	*T J N*	*mg/Kg*	☼	*6.05*	*589-43-5*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Cyclopentane, 1,2,4-trimethyl-	*0.11*	*T J N*	*mg/Kg*	☼	*6.26*	*2815-58-9*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Unknown	*0.089*	*T J*	*mg/Kg*	☼	*6.43*		*11/14/20 16:21*	*11/24/20 14:49*	*1*
Unknown	*0.14*	*T J*	*mg/Kg*	☼	*6.56*		*11/14/20 16:21*	*11/24/20 14:49*	*1*
Benzene, 1-ethyl-2,3-dimethyl-	*0.11*	*T J N*	*mg/Kg*	☼	*10.80*	*933-98-2*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Benzene, 1,2,3,4-tetramethyl-	*0.088*	*T J N*	*mg/Kg*	☼	*11.10*	*488-23-3*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Unknown	*0.10*	*T J*	*mg/Kg*	☼	*11.39*		*11/14/20 16:21*	*11/24/20 14:49*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
4-Bromofluorobenzene (Surr)	*133*	*X*	*50 - 131*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Toluene-d8 (Surr)	*102*		*52 - 141*	*11/14/20 16:21*	*11/24/20 14:49*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
1,2,4,5-Tetrachlorobenzene	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,2'-oxybis[1-chloropropane]	ND		0.047	0.022	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,3,4,6-Tetrachlorophenol	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4,5-Trichlorophenol	ND		0.073	0.033	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4,6-Trichlorophenol	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4-Dichlorophenol	ND		0.047	0.022	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4-Dimethylphenol	ND		0.073	0.033	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4-Dinitrophenol	ND		1.1	0.36	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4-Dinitrotoluene	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,6-Dinitrotoluene	ND		0.054	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Chloronaphthalene	ND		0.036	0.0073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Chlorophenol	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Methylnaphthalene	ND		0.036	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Methylphenol	ND		0.073	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Nitroaniline	ND		0.054	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1

Client Sample ID: B55-PDI-13 (12-12.5)
Date Collected: 11/13/20 09:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-2
Matrix: Soil
Percent Solids: 90.6

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
3,3'-Dichlorobenzidine	ND		0.36	0.11	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
3-Nitroaniline	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4,6-Dinitro-2-methylphenol	ND		0.54	0.25	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Bromophenyl-phenylether	ND		0.054	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Chloro-3-methylphenol	ND		0.054	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
3,4-Methylphenol	ND		0.054	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Nitroaniline	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Nitrophenol	ND		0.54	0.18	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Acenaphthene	ND		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Acenaphthylene	ND		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Acetophenone	ND		0.054	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Anthracene	**0.0060**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Atrazine	ND		0.47	0.22	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzaldehyde	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzo[a]anthracene	**0.019**		0.018	0.0073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzo[a]pyrene	**0.016**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzo[b]fluoranthene	**0.017**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzo[g,h,i]perylene	**0.0050**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzo[k]fluoranthene	**0.010**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Bis(2-chloroethoxy)methane	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Bis(2-chloroethyl)ether	ND		0.054	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Bis(2-ethylhexyl) phthalate	**0.17**	**J**	0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Butylbenzylphthalate	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Caprolactam	ND		0.18	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Carbazole	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Chrysene	**0.014**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Di-n-butyl phthalate	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Di-n-octyl phthalate	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Dibenz(a,h)anthracene	ND		0.018	0.0073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Dibenzofuran	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Diethyl phthalate	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Dimethyl phthalate	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Fluoranthene	**0.039**		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Chloroaniline	ND		0.18	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Fluorene	ND		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Chlorophenyl-phenyl ether	ND		0.047	0.022	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Hexachlorobenzene	ND		0.018	0.0073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Hexachlorobutadiene	ND		0.083	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Hexachlorocyclopentadiene	ND		0.54	0.22	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Hexachloroethane	ND		0.18	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Indeno[1,2,3-cd]pyrene	**0.0055**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Isophorone	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
N-Nitrosodi-n-propylamine	ND		0.054	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
N-Nitrosodiphenylamine	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Naphthalene	ND		0.018	0.0073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Nitrobenzene	ND		0.073	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Phenanthrene	**0.018**		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Aniline	ND		0.54	0.18	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1

Client Sample ID: B55-PDI-13 (12-12.5)

Date Collected: 11/13/20 09:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-2

Matrix: Soil
Percent Solids: 90.6

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenol	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Pyrene	**0.040**		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Pentachlorophenol	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzyl alcohol	ND		0.54	0.18	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
n,n'-Dimethylaniline	ND		0.18	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Pyridine	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Triethylamine	ND	*-	5.4	1.8	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
1,4-Dioxane	ND		0.36	0.11	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.53*	*T J B*	*mg/Kg*	☼	*1.78*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.34*	*T J B*	*mg/Kg*	☼	*3.90*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.17*	*T J*	*mg/Kg*	☼	*4.82*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.22*	*T J*	*mg/Kg*	☼	*4.93*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.21*	*T J*	*mg/Kg*	☼	*6.53*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.18*	*T J*	*mg/Kg*	☼	*6.81*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.33*	*T J*	*mg/Kg*	☼	*8.19*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.44*	*T J*	*mg/Kg*	☼	*8.27*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.23*	*T J*	*mg/Kg*	☼	*8.34*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.42*	*T J*	*mg/Kg*	☼	*8.38*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.46*	*T J*	*mg/Kg*	☼	*8.77*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Cyclic octaatomic sulfur	*0.40*	*T J N*	*mg/Kg*	☼	*11.17*	*10544-50-0*	*11/18/20 16:18*	*11/24/20 15:26*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*99*		*45 - 108*	*11/18/20 16:18*	*11/24/20 15:26*	*1*
Nitrobenzene-d5 (Surr)	*75*		*32 - 97*	*11/18/20 16:18*	*11/24/20 15:26*	*1*
2-Fluorophenol (Surr)	*86*		*26 - 96*	*11/18/20 16:18*	*11/24/20 15:26*	*1*
2-Fluorobiphenyl (Surr)	*87*		*39 - 100*	*11/18/20 16:18*	*11/24/20 15:26*	*1*
2,4,6-Tribromophenol (Surr)	*95*		*13 - 121*	*11/18/20 16:18*	*11/24/20 15:26*	*1*
Phenol-d5 (Surr)	*91*		*27 - 104*	*11/18/20 16:18*	*11/24/20 15:26*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**4.9**		4.4	1.5	mg/Kg	☼	11/18/20 16:18	11/25/20 18:48	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*88*		*45 - 108*	*11/18/20 16:18*	*11/25/20 18:48*	*2*
Nitrobenzene-d5 (Surr)	*68*		*32 - 97*	*11/18/20 16:18*	*11/25/20 18:48*	*2*
2-Fluorophenol (Surr)	*76*		*26 - 96*	*11/18/20 16:18*	*11/25/20 18:48*	*2*
2-Fluorobiphenyl (Surr)	*78*		*39 - 100*	*11/18/20 16:18*	*11/25/20 18:48*	*2*
2,4,6-Tribromophenol (Surr)	*77*		*13 - 121*	*11/18/20 16:18*	*11/25/20 18:48*	*2*
Phenol-d5 (Surr)	*81*		*27 - 104*	*11/18/20 16:18*	*11/25/20 18:48*	*2*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.055	0.028	mg/Kg	☼	11/17/20 17:30	11/18/20 23:29	1
Formaldehyde	**0.12**		0.083	0.028	mg/Kg	☼	11/17/20 17:30	11/18/20 23:29	1
Glutaraldehyde	ND		0.055	0.028	mg/Kg	☼	11/17/20 17:30	11/18/20 23:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*106*		*77 - 133*	*11/17/20 17:30*	*11/18/20 23:29*	*1*

Client Sample ID: B55-PDI-13 (12-12.5)

Lab Sample ID: 410-20914-2
Date Collected: 11/13/20 09:00
Matrix: Soil
Date Received: 11/14/20 10:05
Percent Solids: 90.6

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.4		1.0	1.0	%			11/16/20 20:10	1

Client Sample ID: B55-PDI-07 (13-14)

Lab Sample ID: 410-20914-3
Date Collected: 11/13/20 09:35
Matrix: Soil
Date Received: 11/14/20 10:05
Percent Solids: 80.5

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,1,2,2-Tetrachloroethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,1,2-Trichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,1-Dichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,1-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2,3-Trichlorobenzene	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2,4-Trichlorobenzene	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2,4-Trimethylbenzene	0.00040	J	0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2-Dibromo-3-Chloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2-Dibromoethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2-Dichloroethane	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2-Dichloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,3,5-Trimethylbenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,3-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,4-Dichlorobenzene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,4-Dioxane	ND		0.20	0.029	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
2-Butanone	0.0050	J	0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
2-Hexanone	ND		0.0079	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
2-Nitropropane	ND		0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
4-Methyl-2-pentanone	ND		0.0079	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Acetone	0.027		0.016	0.0048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Acetonitrile	ND		0.079	0.020	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Benzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Bromochloromethane	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Bromodichloromethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Bromoform	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Bromomethane	ND		0.0040	0.00056	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Carbon disulfide	0.00079	J	0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Carbon tetrachloride	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Chlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Chlorodifluoromethane	ND		0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Chloroethane	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Chloroform	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Chloromethane	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
cis-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
cis-1,3-Dichloropropene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Cyclohexane	0.027		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Cyclohexanone	0.033	J	0.20	0.020	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Dibromochloromethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Dichlorodifluoromethane	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Ethyl acetate	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1

Client Sample ID: B55-PDI-07 (13-14)

Date Collected: 11/13/20 09:35
Date Received: 11/14/20 10:05

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-3

Matrix: Soil
Percent Solids: 80.5

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethyl ether	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Ethylbenzene	**0.017**		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Freon 113	ND		0.0079	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Isobutyl alcohol	ND		0.20	0.030	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Isopropylbenzene	**0.0063**		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
m&p-Xylene	**0.0060**		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Methyl acetate	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Methyl tertiary butyl ether	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Methylcyclohexane	**0.0060**		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Methylene Chloride	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Naphthalene	**0.0061**		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
n-Butanol	ND		0.20	0.044	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
n-Butylbenzene	**0.0027**	**J**	0.0064	0.0024	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
n-Heptane	ND		0.0064	0.0024	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
o-Xylene	**0.0033**	**J**	0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
p-Isopropyltoluene	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
sec-Butylbenzene	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Styrene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
t-Butyl alcohol	ND		0.079	0.012	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
tert-Butylbenzene	ND		0.0040	0.00064	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Tetrachloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Tetrahydrofuran	ND		0.0064	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Toluene	**0.00060**	**J**	0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
trans-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
trans-1,3-Dichloropropene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Trichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Trichlorofluoromethane	ND		0.0040	0.00056	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Vinyl chloride	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Xylenes, Total	**0.0093**		0.0079	0.0011	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Butane, 2-methyl-	*0.031*	*T J N*	*mg/Kg*	☼	*2.01*	*78-78-4*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
Unknown	*0.039*	*T J*	*mg/Kg*	☼	*2.08*		*11/14/20 16:21*	*11/24/20 15:11*	*1*
Unknown	*0.012*	*T J*	*mg/Kg*	☼	*6.56*		*11/14/20 16:21*	*11/24/20 15:11*	*1*
Benzene, propyl-	*0.030*	*T J N*	*mg/Kg*	☼	*9.62*	*103-65-1*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
Benzene, 1-ethyl-2-methyl-	*0.028*	*T J N*	*mg/Kg*	☼	*9.90*	*611-14-3*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
Benzene, cyclopropyl-	*0.033*	*T J N*	*mg/Kg*	☼	*10.47*	*873-49-4*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
Benzene, 1-ethyl-2,3-dimethyl-	*0.020*	*T J N*	*mg/Kg*	☼	*10.80*	*933-98-2*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
Benzene, (2-methyl-1-propenyl)-	*0.017*	*T J N*	*mg/Kg*	☼	*10.88*	*768-49-0*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
Benzene, 1,2,3,4-tetramethyl-	*0.021*	*T J N*	*mg/Kg*	☼	*11.06*	*488-23-3*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
Benzene, 1-methyl-4-(2-propenyl)-	*0.013*	*T J N*	*mg/Kg*	☼	*11.39*	*3333-13-9*	*11/14/20 16:21*	*11/24/20 15:11*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*54 - 135*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
4-Bromofluorobenzene (Surr)	*98*		*50 - 131*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
Toluene-d8 (Surr)	*103*		*52 - 141*	*11/14/20 16:21*	*11/24/20 15:11*	*1*

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Client Sample ID: B55-PDI-07 (13-14)
Date Collected: 11/13/20 09:35
Date Received: 11/14/20 10:05

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-3
Matrix: Soil
Percent Solids: 80.5

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
1,2,4,5-Tetrachlorobenzene	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,2'-oxybis[1-chloropropane]	ND		0.053	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4,5-Trichlorophenol	ND		0.082	0.037	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4,6-Trichlorophenol	ND		0.070	0.033	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4-Dichlorophenol	ND		0.053	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4-Dimethylphenol	ND		0.082	0.037	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4-Dinitrophenol	ND		1.2	0.41	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4-Dinitrotoluene	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,6-Dinitrotoluene	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Chloronaphthalene	ND		0.041	0.0082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Chlorophenol	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Methylnaphthalene	ND		0.041	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Methylphenol	ND		0.082	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Nitroaniline	ND		0.062	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Nitrophenol	ND		0.070	0.033	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
3,3'-Dichlorobenzidine	ND		0.41	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
3-Nitroaniline	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4,6-Dinitro-2-methylphenol	ND		0.62	0.29	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Bromophenyl-phenylether	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Chloro-3-methylphenol	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
3,4-Methylphenol	ND		0.062	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Nitroaniline	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Nitrophenol	ND		0.62	0.21	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Acenaphthene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Acenaphthylene	**0.042**		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Acetophenone	ND		0.062	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Anthracene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Atrazine	ND		0.53	0.25	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzaldehyde	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzo[a]anthracene	ND		0.021	0.0082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzo[a]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzo[b]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzo[g,h,i]perylene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzo[k]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Bis(2-chloroethoxy)methane	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Bis(2-chloroethyl)ether	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Bis(2-ethylhexyl) phthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Butylbenzylphthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Caprolactam	ND		0.21	0.041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Carbazole	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Chrysene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Di-n-butyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Di-n-octyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Dibenz(a,h)anthracene	ND		0.021	0.0082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Dibenzofuran	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Diethyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Dimethyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1

Client Sample ID: B55-PDI-07 (13-14)

Date Collected: 11/13/20 09:35
Date Received: 11/14/20 10:05

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-3

Matrix: Soil
Percent Solids: 80.5

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Chloroaniline	ND		0.21	0.041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Fluorene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Chlorophenyl-phenyl ether	ND		0.053	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Hexachlorobenzene	ND		0.021	0.0082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Hexachlorobutadiene	ND		0.094	0.045	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Hexachlorocyclopentadiene	ND		0.62	0.25	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Hexachloroethane	ND		0.21	0.041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Isophorone	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
N-Nitrosodi-n-propylamine	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
N-Nitrosodiphenylamine	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Naphthalene	**0.0088**	**J**	0.021	0.0082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Nitrobenzene	ND		0.082	0.033	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Phenanthrene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Aniline	ND		0.62	0.21	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Phenol	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Pyrene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Pentachlorophenol	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzyl alcohol	ND		0.62	0.21	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
n,n'-Dimethylaniline	ND		0.21	0.041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Pyridine	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Triethylamine	ND	*-	6.2	2.1	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
1,4-Dioxane	ND		0.41	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.43*	*T J B*	*mg/Kg*	☼	*1.77*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Furan, 2,5-dimethyl-	*0.18*	*T J N*	*mg/Kg*	☼	*2.28*	*625-86-5*	*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*1.2*	*T J B*	*mg/Kg*	☼	*3.90*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
2-Cyclohexen-1-one	*0.53*	*T J N*	*mg/Kg*	☼	*4.82*	*930-68-7*	*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*1.6*	*T J*	*mg/Kg*	☼	*8.32*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.86*	*T J*	*mg/Kg*	☼	*8.40*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.43*	*T J*	*mg/Kg*	☼	*8.57*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*1.2*	*T J N*	*mg/Kg*	☼	*8.60*	*7560-83-0*	*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.76*	*T J*	*mg/Kg*	☼	*8.81*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.93*	*T J*	*mg/Kg*	☼	*8.86*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.51*	*T J*	*mg/Kg*	☼	*8.91*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.30*	*T J*	*mg/Kg*	☼	*9.40*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.36*	*T J*	*mg/Kg*	☼	*10.09*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.23*	*T J*	*mg/Kg*	☼	*11.05*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.40*	*T J*	*mg/Kg*	☼	*11.11*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Cyclic octaatomic sulfur	*0.92*	*T J N*	*mg/Kg*	☼	*11.18*	*10544-50-0*	*11/18/20 16:18*	*11/24/20 15:50*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*103*		*45 - 108*	*11/18/20 16:18*	*11/24/20 15:50*	*1*
Nitrobenzene-d5 (Surr)	*76*		*32 - 97*	*11/18/20 16:18*	*11/24/20 15:50*	*1*
2-Fluorophenol (Surr)	*86*		*26 - 96*	*11/18/20 16:18*	*11/24/20 15:50*	*1*
2-Fluorobiphenyl (Surr)	*85*		*39 - 100*	*11/18/20 16:18*	*11/24/20 15:50*	*1*
2,4,6-Tribromophenol (Surr)	*92*		*13 - 121*	*11/18/20 16:18*	*11/24/20 15:50*	*1*

Client Sample ID: B55-PDI-07 (13-14)

Date Collected: 11/13/20 09:35
Date Received: 11/14/20 10:05

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-3
Matrix: Soil
Percent Solids: 80.5

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Phenol-d5 (Surr)	*94*		*27 - 104*	*11/18/20 16:18*	*11/24/20 15:50*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**18**		12	4.1	mg/Kg	☼	11/18/20 16:18	11/25/20 19:12	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*85*		*45 - 108*	*11/18/20 16:18*	*11/25/20 19:12*	*5*
Nitrobenzene-d5 (Surr)	*67*		*32 - 97*	*11/18/20 16:18*	*11/25/20 19:12*	*5*
2-Fluorophenol (Surr)	*76*		*26 - 96*	*11/18/20 16:18*	*11/25/20 19:12*	*5*
2-Fluorobiphenyl (Surr)	*76*		*39 - 100*	*11/18/20 16:18*	*11/25/20 19:12*	*5*
2,4,6-Tribromophenol (Surr)	*71*		*13 - 121*	*11/18/20 16:18*	*11/25/20 19:12*	*5*
Phenol-d5 (Surr)	*81*		*27 - 104*	*11/18/20 16:18*	*11/25/20 19:12*	*5*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	**0.048**	**J**	0.062	0.031	mg/Kg	☼	11/17/20 17:30	11/18/20 23:41	1
Formaldehyde	**0.27**		0.093	0.031	mg/Kg	☼	11/17/20 17:30	11/18/20 23:41	1
Glutaraldehyde	ND		0.062	0.031	mg/Kg	☼	11/17/20 17:30	11/18/20 23:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*117*		*77 - 133*	*11/17/20 17:30*	*11/18/20 23:41*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**19.5**		1.0	1.0	%			11/16/20 20:10	1

Client Sample ID: B55-PDI-11 (5-6)

Date Collected: 11/13/20 09:30
Date Received: 11/14/20 10:05

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-4
Matrix: Soil
Percent Solids: 84.7

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
trans-1,3-Dichloropropene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Ethylbenzene	**0.12**	**J**	0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Styrene	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,4-Dichlorobenzene	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2-Dibromoethane	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2-Dichloroethane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
4-Methyl-2-pentanone	ND		0.52	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Methylcyclohexane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Toluene	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Chlorobenzene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2,4-Trimethylbenzene	**2.9**		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Cyclohexane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2,4-Trichlorobenzene	ND		0.52	0.26	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,4-Dioxane	ND		13	1.9	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Dibromochloromethane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Tetrachloroethene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
cis-1,2-Dichloroethene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50

Client Sample ID: B55-PDI-11 (5-6)
Date Collected: 11/13/20 09:30
Date Received: 11/14/20 10:05

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-4
Matrix: Soil
Percent Solids: 84.7

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Methyl tertiary butyl ether	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
m&p-Xylene	**0.059**	**J**	0.26	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,3,5-Trimethylbenzene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,3-Dichlorobenzene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Carbon tetrachloride	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
2-Hexanone	ND		0.52	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Acetone	ND		1.0	0.31	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Chloroform	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Benzene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,1,1-Trichloroethane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Bromomethane	ND		0.26	0.037	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Chloromethane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Bromochloromethane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Chloroethane	ND		0.26	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Vinyl chloride	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Methylene Chloride	ND		0.26	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Carbon disulfide	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Bromoform	ND	*	0.52	0.26	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Bromodichloromethane	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,1-Dichloroethane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,1-Dichloroethene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Trichlorofluoromethane	ND		0.26	0.037	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Dichlorodifluoromethane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Freon 113	ND		0.52	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2-Dichloropropane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
2-Butanone	ND		0.52	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,1,2-Trichloroethane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
2-Nitropropane	ND	*	0.52	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Trichloroethene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Methyl acetate	ND		0.26	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,1,2,2-Tetrachloroethane	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2,3-Trichlorobenzene	ND		0.52	0.26	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
o-Xylene	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2-Dichlorobenzene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2-Dibromo-3-Chloropropane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Acetonitrile	ND		5.2	1.3	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Isopropylbenzene	**0.23**	**J**	0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Chlorodifluoromethane	ND		0.52	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Cyclohexanone	ND		13	1.3	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Ethyl acetate	ND		0.26	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Ethyl ether	ND		0.26	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Isobutyl alcohol	ND		13	2.0	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Naphthalene	ND		0.26	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
n-Butanol	ND		13	2.9	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
n-Butylbenzene	**1.7**		0.42	0.16	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
n-Heptane	ND		0.42	0.16	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
p-Isopropyltoluene	**0.43**		0.26	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
sec-Butylbenzene	**0.71**		0.26	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50

Client Sample ID: B55-PDI-11 (5-6)
Date Collected: 11/13/20 09:30
Date Received: 11/14/20 10:05

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-4
Matrix: Soil
Percent Solids: 84.7

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
t-Butyl alcohol	ND		5.2	0.78	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
tert-Butylbenzene	ND		0.26	0.042	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Tetrahydrofuran	ND		0.42	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Xylenes, Total	ND		0.52	0.073	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*3.2*	*T J*	*mg/Kg*	☼	*11.12*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*2.9*	*T J*	*mg/Kg*	☼	*11.23*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*3.6*	*T J*	*mg/Kg*	☼	*11.87*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Nonane, 3-methyl-	*2.4*	*T J N*	*mg/Kg*	☼	*11.99*	*5911-04-6*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*2.4*	*T J*	*mg/Kg*	☼	*12.05*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*4.1*	*T J*	*mg/Kg*	☼	*12.22*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Benzene, 2-ethyl-1,3-dimethyl-	*2.8*	*T J N*	*mg/Kg*	☼	*13.68*	*2870-04-4*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
Benzene, 1,2,4,5-tetramethyl-	*3.0*	*T J N*	*mg/Kg*	☼	*13.96*	*95-93-2*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*2.7*	*T J*	*mg/Kg*	☼	*14.28*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*3.9*	*T J*	*mg/Kg*	☼	*14.51*		*11/14/20 16:23*	*11/23/20 03:24*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*54 - 135*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
4-Bromofluorobenzene (Surr)	*127*		*50 - 131*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
Dibromofluoromethane (Surr)	*95*		*50 - 141*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
Toluene-d8 (Surr)	*103*		*52 - 141*	*11/14/20 16:23*	*11/23/20 03:24*	*50*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
1,2,4,5-Tetrachlorobenzene	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,2'-oxybis[1-chloropropane]	ND		0.050	0.023	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,3,4,6-Tetrachlorophenol	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4,5-Trichlorophenol	ND		0.077	0.035	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4,6-Trichlorophenol	ND		0.066	0.031	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4-Dichlorophenol	ND		0.050	0.023	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4-Dimethylphenol	ND		0.077	0.035	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4-Dinitrophenol	ND		1.2	0.39	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4-Dinitrotoluene	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,6-Dinitrotoluene	ND		0.058	0.027	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Chloronaphthalene	ND		0.039	0.0077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Chlorophenol	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Methylnaphthalene	ND		0.039	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Methylphenol	ND		0.077	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Nitroaniline	ND		0.058	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Nitrophenol	ND		0.066	0.031	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
3,3'-Dichlorobenzidine	ND		0.39	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
3-Nitroaniline	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4,6-Dinitro-2-methylphenol	ND		0.58	0.27	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Bromophenyl-phenylether	ND		0.058	0.027	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Chloro-3-methylphenol	ND		0.058	0.027	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
3,4-Methylphenol	ND		0.058	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Nitroaniline	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Nitrophenol	ND		0.58	0.19	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Client Sample ID: B55-PDI-11 (5-6)
Date Collected: 11/13/20 09:30
Date Received: 11/14/20 10:05

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-4
Matrix: Soil
Percent Solids: 84.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Acenaphthylene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Acetophenone	ND		0.058	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Anthracene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Atrazine	ND		0.50	0.23	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzaldehyde	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzo[a]anthracene	ND		0.019	0.0077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzo[a]pyrene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzo[b]fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzo[g,h,i]perylene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzo[k]fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Bis(2-chloroethoxy)methane	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Bis(2-chloroethyl)ether	ND		0.058	0.027	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Bis(2-ethylhexyl) phthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Butylbenzylphthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Caprolactam	ND		0.19	0.039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Carbazole	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Chrysene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Di-n-butyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Di-n-octyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Dibenz(a,h)anthracene	ND		0.019	0.0077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Dibenzofuran	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Diethyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Dimethyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Chloroaniline	ND		0.19	0.039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Fluorene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Chlorophenyl-phenyl ether	ND		0.050	0.023	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Hexachlorobenzene	ND		0.019	0.0077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Hexachlorobutadiene	ND		0.089	0.043	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Hexachlorocyclopentadiene	ND		0.58	0.23	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Hexachloroethane	ND		0.19	0.039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Indeno[1,2,3-cd]pyrene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Isophorone	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
N-Nitrosodi-n-propylamine	ND		0.058	0.027	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
N-Nitrosodiphenylamine	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Naphthalene	ND		0.019	0.0077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Nitrobenzene	ND		0.077	0.031	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Phenanthrene	**0.0086**	**J**	0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Aniline	ND		0.58	0.19	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Phenol	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Pyrene	**0.0069**	**J**	0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Pentachlorophenol	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzyl alcohol	ND		0.58	0.19	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Dicyclohexylamine	**1.7**	**J**	2.3	0.77	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
n,n'-Dimethylaniline	ND		0.19	0.039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Pyridine	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Triethylamine	ND	*-	5.8	1.9	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
1,4-Dioxane	ND		0.39	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Client Sample ID: B55-PDI-11 (5-6)
Date Collected: 11/13/20 09:30
Date Received: 11/14/20 10:05

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-4
Matrix: Soil
Percent Solids: 84.7

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	0.76	T J B	mg/Kg	☼	1.78		11/18/20 16:18	11/24/20 16:15	1
Unknown	0.52	T J B	mg/Kg	☼	3.90		11/18/20 16:18	11/24/20 16:15	1
Dodecane, 2,6,11-trimethyl-	0.41	T J N	mg/Kg	☼	5.68	31295-56-4	11/18/20 16:18	11/24/20 16:15	1
Benzene, 1,3-diethyl-	0.33	T J N	mg/Kg	☼	5.79	141-93-5	11/18/20 16:18	11/24/20 16:15	1
Unknown	0.34	T J	mg/Kg	☼	5.86		11/18/20 16:18	11/24/20 16:15	1
Unknown	0.37	T J	mg/Kg	☼	5.93		11/18/20 16:18	11/24/20 16:15	1
Benzene, 2-ethyl-1,4-dimethyl-	0.38	T J N	mg/Kg	☼	6.00	1758-88-9	11/18/20 16:18	11/24/20 16:15	1
Unknown	0.36	T J	mg/Kg	☼	6.24		11/18/20 16:18	11/24/20 16:15	1
Benzene, 1,2,3,4-tetramethyl-	0.36	T J N	mg/Kg	☼	6.29	488-23-3	11/18/20 16:18	11/24/20 16:15	1
Benzene, 1,2,3,5-tetramethyl-	0.52	T J N	mg/Kg	☼	6.31	527-53-7	11/18/20 16:18	11/24/20 16:15	1
Benzene, 1-methyl-4-(1-methylpropyl)-	0.43	T J N	mg/Kg	☼	6.41	1595-16-0	11/18/20 16:18	11/24/20 16:15	1
Unknown	0.78	T J	mg/Kg	☼	6.53		11/18/20 16:18	11/24/20 16:15	1
Benzene, 1-methyl-3-(1-methylethyl)-	0.52	T J N	mg/Kg	☼	6.57	535-77-3	11/18/20 16:18	11/24/20 16:15	1
Unknown	0.51	T J	mg/Kg	☼	6.62		11/18/20 16:18	11/24/20 16:15	1
Unknown	0.80	T J	mg/Kg	☼	6.81		11/18/20 16:18	11/24/20 16:15	1
Unknown	0.45	T J	mg/Kg	☼	6.88		11/18/20 16:18	11/24/20 16:15	1
Unknown	0.36	T J	mg/Kg	☼	6.94		11/18/20 16:18	11/24/20 16:15	1
Unknown	0.33	T J	mg/Kg	☼	6.97		11/18/20 16:18	11/24/20 16:15	1
1H-Indene, 2,3-dihydro-4,7-dimethyl-	0.36	T J N	mg/Kg	☼	7.16	6682-71-9	11/18/20 16:18	11/24/20 16:15	1
Unknown	0.48	T J	mg/Kg	☼	8.41		11/18/20 16:18	11/24/20 16:15	1
Unknown	0.75	T J	mg/Kg	☼	8.81		11/18/20 16:18	11/24/20 16:15	1
Unknown	1.2	T J	mg/Kg	☼	9.77		11/18/20 16:18	11/24/20 16:15	1
Unknown	0.40	T J	mg/Kg	☼	10.10		11/18/20 16:18	11/24/20 16:15	1
Cyclic octaatomic sulfur	1.3	T J N	mg/Kg	☼	11.11	10544-50-0	11/18/20 16:18	11/24/20 16:15	1
Unknown	1.1	T J	mg/Kg	☼	11.18		11/18/20 16:18	11/24/20 16:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	101		45 - 108	11/18/20 16:18	11/24/20 16:15	1
Nitrobenzene-d5 (Surr)	73		32 - 97	11/18/20 16:18	11/24/20 16:15	1
2-Fluorophenol (Surr)	81		26 - 96	11/18/20 16:18	11/24/20 16:15	1
2-Fluorobiphenyl (Surr)	84		39 - 100	11/18/20 16:18	11/24/20 16:15	1
2,4,6-Tribromophenol (Surr)	92		13 - 121	11/18/20 16:18	11/24/20 16:15	1
Phenol-d5 (Surr)	85		27 - 104	11/18/20 16:18	11/24/20 16:15	1

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.059	0.030	mg/Kg	☼	11/17/20 17:30	11/18/20 23:53	1
Formaldehyde	**0.47**		0.089	0.030	mg/Kg	☼	11/17/20 17:30	11/18/20 23:53	1
Glutaraldehyde	ND		0.059	0.030	mg/Kg	☼	11/17/20 17:30	11/18/20 23:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	113		77 - 133	11/17/20 17:30	11/18/20 23:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**15.3**		1.0	1.0	%			11/16/20 20:10	1

Client Sample ID: EB11132020
Date Collected: 11/13/20 07:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-5
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
1,2,4,5-Tetrachlorobenzene	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,2'-oxybis[1-chloropropane]	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,3,4,6-Tetrachlorophenol	ND		11	4.4	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4,5-Trichlorophenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4,6-Trichlorophenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4-Dichlorophenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4-Dimethylphenol	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4-Dinitrophenol	ND		33	15	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4-Dinitrotoluene	ND		5.5	1.1	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,6-Dinitrotoluene	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Chloronaphthalene	ND		1.1	0.44	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Chlorophenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Methylnaphthalene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Methylphenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Nitroaniline	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Nitrophenol	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
3,3'-Dichlorobenzidine	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
3-Nitroaniline	ND		7.7	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
4,6-Dinitro-2-methylphenol	ND		23	8.7	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Bromophenyl-phenylether	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Chloro-3-methylphenol	ND		3.8	1.7	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Chloroaniline	ND		11	4.4	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Chlorophenyl-phenyl ether	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
3,4-Methylphenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Nitroaniline	ND		3.3	0.98	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Nitrophenol	ND		33	11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Acenaphthene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Acenaphthylene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Acetophenone	ND		11	4.4	ug/L		11/20/20 09:00	12/02/20 14:50	1
Aniline	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
Anthracene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Atrazine	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzaldehyde	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzo[a]anthracene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzo[a]pyrene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzo[b]fluoranthene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzo[g,h,i]perylene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzo[k]fluoranthene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzyl alcohol	ND		33	11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Butylbenzylphthalate	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Caprolactam	ND		12	5.5	ug/L		11/20/20 09:00	12/02/20 14:50	1
Carbazole	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Chrysene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Di-n-butyl phthalate	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Di-n-octyl phthalate	ND		12	5.5	ug/L		11/20/20 09:00	12/02/20 14:50	1
Dibenz(a,h)anthracene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Dibenzofuran	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Dicyclohexylamine	ND		22	11	ug/L		11/20/20 09:00	12/02/20 14:50	1

Client Sample ID: EB11132020
Date Collected: 11/13/20 07:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-5
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diethyl phthalate	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Dimethyl phthalate	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Fluoranthene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Fluorene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Hexachlorobenzene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Hexachlorobutadiene	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Hexachlorocyclopentadiene	ND	*+	12	5.5	ug/L		11/20/20 09:00	12/02/20 14:50	1
Hexachloroethane	ND		5.5	1.1	ug/L		11/20/20 09:00	12/02/20 14:50	1
Indeno[1,2,3-cd]pyrene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Isophorone	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
n,n'-Dimethylaniline	ND		1.1	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
N-Nitrosodi-n-propylamine	ND		3.3	0.77	ug/L		11/20/20 09:00	12/02/20 14:50	1
N-Nitrosodiphenylamine	ND		3.3	0.77	ug/L		11/20/20 09:00	12/02/20 14:50	1
Naphthalene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Nitrobenzene	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Pentachlorophenol	ND		5.5	1.1	ug/L		11/20/20 09:00	12/02/20 14:50	1
Phenanthrene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Phenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Pyrene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Pyridine	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Triethylamine	ND		11	11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Bis(2-chloroethoxy)methane	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Bis(2-chloroethyl)ether	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Bis(2-ethylhexyl) phthalate	ND		12	5.5	ug/L		11/20/20 09:00	12/02/20 14:50	1
1,4-Dioxane	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*11/20/20 09:00*	*12/02/20 14:50*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*82*		*10 - 150*	*11/20/20 09:00*	*12/02/20 14:50*	*1*
2-Fluorobiphenyl (Surr)	*71*		*44 - 102*	*11/20/20 09:00*	*12/02/20 14:50*	*1*
2-Fluorophenol (Surr)	*49*		*10 - 84*	*11/20/20 09:00*	*12/02/20 14:50*	*1*
Nitrobenzene-d5 (Surr)	*74*		*23 - 128*	*11/20/20 09:00*	*12/02/20 14:50*	*1*
p-Terphenyl-d14 (Surr)	*84*		*31 - 113*	*11/20/20 09:00*	*12/02/20 14:50*	*1*
Phenol-d5 (Surr)	*38*		*10 - 67*	*11/20/20 09:00*	*12/02/20 14:50*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/16/20 17:00	11/19/20 01:01	1
Formaldehyde	ND		50	20	ug/L		11/16/20 17:00	11/19/20 01:01	1
Glutaraldehyde	ND		50	30	ug/L		11/16/20 17:00	11/19/20 01:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*94*		*39 - 153*	*11/16/20 17:00*	*11/19/20 01:01*	*1*

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Client Sample ID: B55-PDI-SB-15 (8-9)
Date Collected: 11/13/20 13:15
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-6
Matrix: Soil
Percent Solids: 83.6

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,1,2,2-Tetrachloroethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,1,2-Trichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,1-Dichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,1-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2,3-Trichlorobenzene	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2,4-Trichlorobenzene	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2,4-Trimethylbenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2-Dibromo-3-Chloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2-Dibromoethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2-Dichloroethane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2-Dichloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,3,5-Trimethylbenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,3-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,4-Dichlorobenzene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,4-Dioxane	ND		0.20	0.029	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
2-Butanone	**0.0038**	**J**	0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
2-Hexanone	ND		0.0079	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
2-Nitropropane	ND		0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
4-Methyl-2-pentanone	ND		0.0079	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Acetone	**0.080**		0.016	0.0047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Acetonitrile	ND		0.079	0.020	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Benzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Bromochloromethane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Bromodichloromethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Bromoform	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Bromomethane	ND		0.0040	0.00055	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Carbon disulfide	**0.00098**	**J**	0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Carbon tetrachloride	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Chlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Chlorodifluoromethane	ND		0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Chloroethane	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Chloroform	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Chloromethane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
cis-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
cis-1,3-Dichloropropene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Cyclohexane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Cyclohexanone	**2.2**		0.20	0.020	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Dibromochloromethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Dichlorodifluoromethane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Ethyl acetate	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Ethyl ether	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Ethylbenzene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Freon 113	ND		0.0079	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Isobutyl alcohol	ND		0.20	0.030	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Isopropylbenzene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
m&p-Xylene	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Methyl acetate	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1

Client Sample ID: B55-PDI-SB-15 (8-9)

Date Collected: 11/13/20 13:15
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-6

Matrix: Soil
Percent Solids: 83.6

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Methylcyclohexane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Methylene Chloride	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Naphthalene	**0.0021**	**J**	0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
n-Butanol	ND		0.20	0.044	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
n-Butylbenzene	ND		0.0063	0.0024	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
n-Heptane	ND		0.0063	0.0024	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
o-Xylene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
p-Isopropyltoluene	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
sec-Butylbenzene	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Styrene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
t-Butyl alcohol	**0.044**	**J**	0.079	0.012	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
tert-Butylbenzene	ND		0.0040	0.00063	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Tetrachloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Tetrahydrofuran	ND		0.0063	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Toluene	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
trans-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
trans-1,3-Dichloropropene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Trichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Trichlorofluoromethane	ND		0.0040	0.00055	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Vinyl chloride	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Xylenes, Total	ND		0.0079	0.0011	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.12*	*T J*	*mg/Kg*	☼	*5.22*		*11/14/20 16:21*	*11/24/20 15:34*	*1*
Hexane, 2,5-dimethyl-	*0.17*	*T J N*	*mg/Kg*	☼	*6.00*	*592-13-2*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Hexane, 2,4-dimethyl-	*0.074*	*T J N*	*mg/Kg*	☼	*6.06*	*589-43-5*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Cyclopentane, 1,2,4-trimethyl-	*0.11*	*T J N*	*mg/Kg*	☼	*6.26*	*2815-58-9*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Unknown	*0.11*	*T J*	*mg/Kg*	☼	*8.06*		*11/14/20 16:21*	*11/24/20 15:34*	*1*
Cyclohexane, 1,2,4-trimethyl-	*0.098*	*T J N*	*mg/Kg*	☼	*8.24*	*2234-75-5*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Unknown	*0.14*	*T J*	*mg/Kg*	☼	*9.11*		*11/14/20 16:21*	*11/24/20 15:34*	*1*
Unknown	*0.18*	*T J*	*mg/Kg*	☼	*9.17*		*11/14/20 16:21*	*11/24/20 15:34*	*1*
Cyclopentanone, 2-methyl-3-(1-methylethyl)-	*0.15*	*T J N*	*mg/Kg*	☼	*9.24*	*54549-81-4*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Unknown	*0.10*	*T J*	*mg/Kg*	☼	*9.34*		*11/14/20 16:21*	*11/24/20 15:34*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*54 - 135*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Toluene-d8 (Surr)	*92*		*52 - 141*	*11/14/20 16:21*	*11/24/20 15:34*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
1,2,4,5-Tetrachlorobenzene	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,2'-oxybis[1-chloropropane]	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4,5-Trichlorophenol	ND		0.080	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4,6-Trichlorophenol	ND		0.068	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1

Client Sample ID: B55-PDI-SB-15 (8-9)
Date Collected: 11/13/20 13:15
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-6
Matrix: Soil
Percent Solids: 83.6

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenol	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4-Dimethylphenol	ND		0.080	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4-Dinitrophenol	ND		1.2	0.40	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4-Dinitrotoluene	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,6-Dinitrotoluene	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Chloronaphthalene	ND		0.040	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Chlorophenol	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Methylnaphthalene	ND		0.040	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Methylphenol	ND		0.080	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Nitroaniline	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Nitrophenol	ND		0.068	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
3,3'-Dichlorobenzidine	ND		0.40	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
3-Nitroaniline	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4,6-Dinitro-2-methylphenol	ND		0.60	0.28	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Bromophenyl-phenylether	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Chloro-3-methylphenol	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
3,4-Methylphenol	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Nitroaniline	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Nitrophenol	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Acenaphthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Acenaphthylene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Acetophenone	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Anthracene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Atrazine	ND		0.52	0.24	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzaldehyde	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzo[a]anthracene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzo[a]pyrene	**0.0061**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzo[b]fluoranthene	**0.0058**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzo[g,h,i]perylene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzo[k]fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Bis(2-chloroethoxy)methane	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Bis(2-chloroethyl)ether	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Butylbenzylphthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Caprolactam	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Carbazole	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Chrysene	**0.0052**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Di-n-butyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Di-n-octyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Dibenz(a,h)anthracene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Dibenzofuran	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Diethyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Dimethyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Fluoranthene	**0.013**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Chloroaniline	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Fluorene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Chlorophenyl-phenyl ether	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Hexachlorobenzene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Hexachlorobutadiene	ND		0.091	0.044	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1

Client Sample ID: B55-PDI-SB-15 (8-9)
Date Collected: 11/13/20 13:15
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-6
Matrix: Soil
Percent Solids: 83.6

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachlorocyclopentadiene	ND		0.60	0.24	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Hexachloroethane	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Isophorone	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
N-Nitrosodi-n-propylamine	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
N-Nitrosodiphenylamine	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Naphthalene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Nitrobenzene	ND		0.080	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Phenanthrene	**0.0040**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Aniline	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Phenol	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Pyrene	**0.0099**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Pentachlorophenol	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzyl alcohol	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
n,n'-Dimethylaniline	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Pyridine	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Triethylamine	ND	*-	6.0	2.0	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
1,4-Dioxane	ND		0.40	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.27*	*T J*	*mg/Kg*	☼	*3.25*		*11/18/20 16:18*	*11/24/20 16:39*	*1*
Unknown	*1.2*	*T J B*	*mg/Kg*	☼	*3.90*		*11/18/20 16:18*	*11/24/20 16:39*	*1*
Unknown	*0.20*	*T J*	*mg/Kg*	☼	*4.81*		*11/18/20 16:18*	*11/24/20 16:39*	*1*
Unknown	*0.72*	*T J*	*mg/Kg*	☼	*8.25*		*11/18/20 16:18*	*11/24/20 16:39*	*1*
Unknown	*0.69*	*T J*	*mg/Kg*	☼	*8.33*		*11/18/20 16:18*	*11/24/20 16:39*	*1*
Unknown	*0.25*	*T J*	*mg/Kg*	☼	*8.39*		*11/18/20 16:18*	*11/24/20 16:39*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.52*	*T J N*	*mg/Kg*	☼	*8.61*	*7560-83-0*	*11/18/20 16:18*	*11/24/20 16:39*	*1*
Unknown	*0.56*	*T J*	*mg/Kg*	☼	*8.78*		*11/18/20 16:18*	*11/24/20 16:39*	*1*
Unknown	*0.33*	*T J*	*mg/Kg*	☼	*10.09*		*11/18/20 16:18*	*11/24/20 16:39*	*1*
Cyclic octaatomic sulfur	*0.27*	*T J N*	*mg/Kg*	☼	*11.17*	*10544-50-0*	*11/18/20 16:18*	*11/24/20 16:39*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*98*		*45 - 108*	*11/18/20 16:18*	*11/24/20 16:39*	*1*
Nitrobenzene-d5 (Surr)	*69*		*32 - 97*	*11/18/20 16:18*	*11/24/20 16:39*	*1*
2-Fluorophenol (Surr)	*78*		*26 - 96*	*11/18/20 16:18*	*11/24/20 16:39*	*1*
2-Fluorobiphenyl (Surr)	*79*		*39 - 100*	*11/18/20 16:18*	*11/24/20 16:39*	*1*
2,4,6-Tribromophenol (Surr)	*78*		*13 - 121*	*11/18/20 16:18*	*11/24/20 16:39*	*1*
Phenol-d5 (Surr)	*82*		*27 - 104*	*11/18/20 16:18*	*11/24/20 16:39*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**5.0**		4.8	1.6	mg/Kg	☼	11/18/20 16:18	11/25/20 19:37	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*86*		*45 - 108*	*11/18/20 16:18*	*11/25/20 19:37*	*2*
Nitrobenzene-d5 (Surr)	*62*		*32 - 97*	*11/18/20 16:18*	*11/25/20 19:37*	*2*
2-Fluorophenol (Surr)	*69*		*26 - 96*	*11/18/20 16:18*	*11/25/20 19:37*	*2*
2-Fluorobiphenyl (Surr)	*69*		*39 - 100*	*11/18/20 16:18*	*11/25/20 19:37*	*2*
2,4,6-Tribromophenol (Surr)	*63*		*13 - 121*	*11/18/20 16:18*	*11/25/20 19:37*	*2*
Phenol-d5 (Surr)	*72*		*27 - 104*	*11/18/20 16:18*	*11/25/20 19:37*	*2*

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Client Sample ID: B55-PDI-SB-15 (8-9)
Date Collected: 11/13/20 13:15
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-6
Matrix: Soil
Percent Solids: 83.6

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	0.059	J	0.060	0.030	mg/Kg	☼	11/17/20 17:30	11/19/20 00:04	1
Formaldehyde	0.39		0.090	0.030	mg/Kg	☼	11/17/20 17:30	11/19/20 00:04	1
Glutaraldehyde	ND		0.060	0.030	mg/Kg	☼	11/17/20 17:30	11/19/20 00:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*109*		*77 - 133*	*11/17/20 17:30*	*11/19/20 00:04*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	16.4		1.0	1.0	%			11/16/20 20:10	1

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Soil — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(54-135)	(50-131)	(50-141)	(52-141)
410-20914-1	B55-PDI-13 (6-8)	104	124	99	104
410-20914-2	B55-PDI-13 (12-12.5)	100	133 X	99	102
410-20914-3	B55-PDI-07 (13-14)	99	98	99	103
410-20914-4	B55-PDI-11 (5-6)	97	127	95	103
410-20914-6	B55-PDI-SB-15 (8-9)	97	99	99	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(54-135)	(50-131)	(50-141)	(52-141)
LCS 410-69161/5	Lab Control Sample	102	91	100	98
LCS 410-69161/7	Lab Control Sample	97	92	95	94
LCS 410-69809/5	Lab Control Sample	102	100	100	101
LCS 410-69809/7	Lab Control Sample	106	99	100	100
LCSD 410-69161/6	Lab Control Sample Dup	103	93	102	100
LCSD 410-69161/8	Lab Control Sample Dup	99	90	96	94
LCSD 410-69809/6	Lab Control Sample Dup	101	100	100	100
LCSD 410-69809/8	Lab Control Sample Dup	102	99	100	101
MB 410-69161/9	Method Blank	100	89	96	96
MB 410-69809/10	Method Blank	105	99	100	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Soil — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TPHd14	NBZ	2FP	FBP	TBP	PHL
Lab Sample ID	Client Sample ID	(45-108)	(32-97)	(26-96)	(39-100)	(13-121)	(27-104)
410-20914-1	B55-PDI-13 (6-8)	105	77	88	88	92	95
410-20914-1 - DL	B55-PDI-13 (6-8)	88	67	77	77	69	80
410-20914-2	B55-PDI-13 (12-12.5)	99	75	86	87	95	91
410-20914-2 - DL	B55-PDI-13 (12-12.5)	88	68	76	78	77	81
410-20914-3	B55-PDI-07 (13-14)	103	76	86	85	92	94
410-20914-3 - DL	B55-PDI-07 (13-14)	85	67	76	76	71	81
410-20914-4	B55-PDI-11 (5-6)	101	73	81	84	92	85
410-20914-6	B55-PDI-SB-15 (8-9)	98	69	78	79	78	82
410-20914-6 - DL	B55-PDI-SB-15 (8-9)	86	62	69	69	63	72

Surrogate Legend

Surrogate Summary

Client: ARCADIS U.S. Inc
Job ID: 410-20914-1
Project/Site: Bristol-Myers Squibb

TPHd14 = p-Terphenyl-d14 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
2FP = 2-Fluorophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(13-121)	(39-100)	(26-96)	(32-97)	(45-108)	(27-104)
LCS 410-67649/2-A	Lab Control Sample	101	84	79	73	104	84
LCS 410-67649/5-A	Lab Control Sample	98	93	84	76	112 S1+	85
LCSD 410-67649/6-A	Lab Control Sample Dup	87	81	77	69	105	79
MB 410-67649/1-A	Method Blank	98	95	82	75	112 S1+	85

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(10-150)	(44-102)	(10-84)	(23-128)	(31-113)	(10-67)
410-20914-5	EB11132020	82	71	49	74	84	38
LCS 410-68429/2-A	Lab Control Sample	82	72	55	75	86	43
MB 410-68429/1-A	Method Blank	83	76	45	74	88	35

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Soil — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BTRA
Lab Sample ID	Client Sample ID	(77-133)
410-20914-1	B55-PDI-13 (6-8)	112
410-20914-1 - DL	B55-PDI-13 (6-8)	108
410-20914-1 MS	B55-PDI-13 (6-8)	116
410-20914-1 MSD	B55-PDI-13 (6-8)	102
410-20914-2	B55-PDI-13 (12-12.5)	106
410-20914-3	B55-PDI-07 (13-14)	117
410-20914-4	B55-PDI-11 (5-6)	113
410-20914-6	B55-PDI-SB-15 (8-9)	109

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Surrogate Legend
BTRA = Butyraldehyde

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	**Client Sample ID**	**BTRA (77-133)**
LCS 410-66658/2-A	Lab Control Sample	112
MB 410-66658/1-A	Method Blank	115

Surrogate Legend
BTRA = Butyraldehyde

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	**Client Sample ID**	**BTRA (39-153)**
410-20914-5	EB11132020	94
LCS 410-66613/2-A	Lab Control Sample	95
LCSD 410-66613/3-A	Lab Control Sample Dup	82
MB 410-66613/1-A	Method Blank	88

Surrogate Legend
BTRA = Butyraldehyde

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 410-69161/9
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
1,2,4-Trimethylbenzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,2-Dichloroethane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
1,2,4-Trichlorobenzene	ND		0.50	0.25	mg/Kg			11/22/20 21:04	50
1,4-Dichlorobenzene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
1,4-Dioxane	ND		13	1.9	mg/Kg			11/22/20 21:04	50
4-Methyl-2-pentanone	ND		0.50	0.050	mg/Kg			11/22/20 21:04	50
1,3,5-Trimethylbenzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,3-Dichlorobenzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
2-Hexanone	ND		0.50	0.050	mg/Kg			11/22/20 21:04	50
Acetone	ND		1.0	0.30	mg/Kg			11/22/20 21:04	50
Benzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,1,1-Trichloroethane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
Bromomethane	ND		0.25	0.035	mg/Kg			11/22/20 21:04	50
Carbon tetrachloride	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Chlorobenzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Bromochloromethane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
Chloroethane	ND		0.25	0.050	mg/Kg			11/22/20 21:04	50
Chloroform	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
Chloromethane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
Carbon disulfide	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
cis-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Bromoform	ND		0.50	0.25	mg/Kg			11/22/20 21:04	50
cis-1,3-Dichloropropene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
Bromodichloromethane	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
Cyclohexane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,1-Dichloroethane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,1-Dichloroethene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Dibromochloromethane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Dichlorodifluoromethane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
1,2-Dichloropropane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Ethylbenzene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
2-Butanone	ND		0.50	0.10	mg/Kg			11/22/20 21:04	50
Freon 113	ND		0.50	0.030	mg/Kg			11/22/20 21:04	50
1,1,2-Trichloroethane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
2-Nitropropane	ND		0.50	0.10	mg/Kg			11/22/20 21:04	50
m&p-Xylene	ND		0.25	0.050	mg/Kg			11/22/20 21:04	50
Methyl acetate	ND		0.25	0.050	mg/Kg			11/22/20 21:04	50
1,1,2,2-Tetrachloroethane	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
Methyl tertiary butyl ether	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,2,3-Trichlorobenzene	ND		0.50	0.25	mg/Kg			11/22/20 21:04	50
Methylcyclohexane	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
Methylene Chloride	ND		0.25	0.10	mg/Kg			11/22/20 21:04	50
1,2-Dichlorobenzene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
1,2-Dibromo-3-Chloropropane	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Acetonitrile	ND		5.0	1.3	mg/Kg			11/22/20 21:04	50
Isopropylbenzene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
o-Xylene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-69161/9
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorodifluoromethane	ND		0.50	0.10	mg/Kg			11/22/20 21:04	50
Styrene	ND		0.25	0.020	mg/Kg			11/22/20 21:04	50
Cyclohexanone	ND		13	1.3	mg/Kg			11/22/20 21:04	50
Ethyl acetate	ND		0.25	0.050	mg/Kg			11/22/20 21:04	50
Ethyl ether	ND		0.25	0.050	mg/Kg			11/22/20 21:04	50
Tetrachloroethene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Isobutyl alcohol	ND		13	1.9	mg/Kg			11/22/20 21:04	50
Naphthalene	ND		0.25	0.10	mg/Kg			11/22/20 21:04	50
Toluene	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
n-Butanol	ND		13	2.8	mg/Kg			11/22/20 21:04	50
trans-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
n-Butylbenzene	ND		0.40	0.15	mg/Kg			11/22/20 21:04	50
trans-1,3-Dichloropropene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
n-Heptane	ND		0.40	0.15	mg/Kg			11/22/20 21:04	50
Trichloroethene	ND		0.25	0.025	mg/Kg			11/22/20 21:04	50
Trichlorofluoromethane	ND		0.25	0.035	mg/Kg			11/22/20 21:04	50
p-Isopropyltoluene	ND		0.25	0.10	mg/Kg			11/22/20 21:04	50
Vinyl chloride	ND		0.25	0.030	mg/Kg			11/22/20 21:04	50
sec-Butylbenzene	ND		0.25	0.10	mg/Kg			11/22/20 21:04	50
t-Butyl alcohol	ND		5.0	0.75	mg/Kg			11/22/20 21:04	50
tert-Butylbenzene	ND		0.25	0.040	mg/Kg			11/22/20 21:04	50
Tetrahydrofuran	ND		0.40	0.050	mg/Kg			11/22/20 21:04	50
Xylenes, Total	ND		0.50	0.070	mg/Kg			11/22/20 21:04	50

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*					*11/22/20 21:04*	*50*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*		*11/22/20 21:04*	*50*
4-Bromofluorobenzene (Surr)	*89*		*50 - 131*		*11/22/20 21:04*	*50*
Dibromofluoromethane (Surr)	*96*		*50 - 141*		*11/22/20 21:04*	*50*
Toluene-d8 (Surr)	*96*		*52 - 141*		*11/22/20 21:04*	*50*

Lab Sample ID: LCS 410-69161/5
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	1.00	1.07		mg/Kg		107	76 - 120
1,2,4-Trimethylbenzene	1.00	0.950		mg/Kg		95	73 - 120
1,2-Dichloroethane	1.00	0.971		mg/Kg		97	71 - 128
1,2,4-Trichlorobenzene	1.00	0.953		mg/Kg		95	56 - 130
1,4-Dichlorobenzene	1.00	1.02		mg/Kg		102	80 - 120
1,4-Dioxane	25.0	28.0		mg/Kg		112	62 - 131
4-Methyl-2-pentanone	5.00	4.52		mg/Kg		90	67 - 128
1,3,5-Trimethylbenzene	1.00	0.966		mg/Kg		97	73 - 120
1,3-Dichlorobenzene	1.00	1.02		mg/Kg		102	75 - 120
2-Hexanone	5.00	4.17		mg/Kg		83	54 - 140

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69161/5
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	7.50	4.77		mg/Kg		64	41 - 150
Benzene	1.00	0.991		mg/Kg		99	80 - 120
1,1,1-Trichloroethane	1.00	1.12		mg/Kg		112	69 - 123
Bromomethane	1.00	1.22		mg/Kg		122	45 - 140
Carbon tetrachloride	1.00	1.25		mg/Kg		125	64 - 134
Chlorobenzene	1.00	1.03		mg/Kg		103	80 - 120
Bromochloromethane	1.00	1.02		mg/Kg		102	72 - 124
Chloroethane	1.00	0.819		mg/Kg		82	43 - 135
Chloroform	1.00	0.991		mg/Kg		99	80 - 120
Chloromethane	1.00	0.776		mg/Kg		78	56 - 120
Carbon disulfide	1.00	1.04		mg/Kg		104	64 - 133
cis-1,2-Dichloroethene	1.00	1.08		mg/Kg		108	80 - 125
Bromoform	1.00	1.31	*	mg/Kg		131	51 - 127
cis-1,3-Dichloropropene	1.00	1.12		mg/Kg		112	66 - 120
Bromodichloromethane	1.00	1.12		mg/Kg		112	70 - 120
Cyclohexane	1.00	0.949		mg/Kg		95	58 - 126
1,1-Dichloroethane	1.00	0.963		mg/Kg		96	79 - 120
1,1-Dichloroethene	1.00	1.05		mg/Kg		105	73 - 129
Dibromochloromethane	1.00	1.18		mg/Kg		118	69 - 125
Dichlorodifluoromethane	1.00	0.916		mg/Kg		92	21 - 127
1,2-Dichloropropane	1.00	0.982		mg/Kg		98	80 - 120
Ethylbenzene	1.00	0.986		mg/Kg		99	78 - 120
2-Butanone	7.50	5.01		mg/Kg		67	57 - 128
Freon 113	1.00	1.03		mg/Kg		103	64 - 135
1,1,2-Trichloroethane	1.00	1.05		mg/Kg		105	80 - 120
2-Nitropropane	1.00	2.48	*	mg/Kg		248	27 - 183
m&p-Xylene	2.00	2.05		mg/Kg		103	80 - 120
Methyl acetate	1.00	0.972		mg/Kg		97	67 - 128
1,1,2,2-Tetrachloroethane	1.00	0.924		mg/Kg		92	69 - 125
Methyl tertiary butyl ether	1.00	0.947		mg/Kg		95	72 - 120
1,2,3-Trichlorobenzene	1.00	0.845		mg/Kg		85	57 - 131
Methylcyclohexane	1.00	1.01		mg/Kg		101	61 - 124
Methylene Chloride	1.00	0.983		mg/Kg		98	76 - 122
1,2-Dichlorobenzene	1.00	0.984		mg/Kg		98	76 - 120
1,2-Dibromo-3-Chloropropane	1.00	0.792		mg/Kg		79	48 - 134
Isopropylbenzene	1.00	0.995		mg/Kg		99	77 - 120
o-Xylene	1.00	0.986		mg/Kg		99	75 - 120
Styrene	1.00	1.01		mg/Kg		101	76 - 120
Cyclohexanone	25.0	23.1		mg/Kg		92	47 - 136
Tetrachloroethene	1.00	1.08		mg/Kg		108	73 - 120
Isobutyl alcohol	25.0	24.8		mg/Kg		99	69 - 129
Naphthalene	1.00	0.759		mg/Kg		76	48 - 130
Toluene	1.00	1.00		mg/Kg		100	80 - 120
n-Butanol	50.0	57.8		mg/Kg		116	63 - 123
trans-1,2-Dichloroethene	1.00	1.02		mg/Kg		102	80 - 126
n-Butylbenzene	1.00	0.929		mg/Kg		93	71 - 121
trans-1,3-Dichloropropene	1.00	1.08		mg/Kg		108	68 - 122
n-Heptane	1.00	1.02		mg/Kg		102	50 - 141
Trichloroethene	1.00	1.02		mg/Kg		102	80 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69161/5
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Trichlorofluoromethane	1.00	0.932		mg/Kg		93	55 - 134
p-Isopropyltoluene	1.00	0.979		mg/Kg		98	72 - 120
Vinyl chloride	1.00	0.865		mg/Kg		87	52 - 120
sec-Butylbenzene	1.00	0.960		mg/Kg		96	72 - 120
t-Butyl alcohol	10.0	10.7		mg/Kg		107	74 - 121
tert-Butylbenzene	1.00	1.02		mg/Kg		102	68 - 120
Tetrahydrofuran	5.00	4.38		mg/Kg		88	71 - 127
Xylenes, Total	3.00	3.04		mg/Kg		101	75 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*54 - 135*
4-Bromofluorobenzene (Surr)	*91*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*98*		*52 - 141*

Lab Sample ID: LCS 410-69161/7
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetonitrile	7.50	7.01		mg/Kg		93	61 - 120
Chlorodifluoromethane	1.00	0.856		mg/Kg		86	60 - 133
Ethyl acetate	1.00	0.879		mg/Kg		88	65 - 133
Ethyl ether	1.00	1.03		mg/Kg		103	59 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*54 - 135*
4-Bromofluorobenzene (Surr)	*92*		*50 - 131*
Dibromofluoromethane (Surr)	*95*		*50 - 141*
Toluene-d8 (Surr)	*94*		*52 - 141*

Lab Sample ID: LCSD 410-69161/6
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane	1.00	1.09		mg/Kg		109	76 - 120	2	30
1,2,4-Trimethylbenzene	1.00	0.976		mg/Kg		98	73 - 120	3	30
1,2-Dichloroethane	1.00	0.996		mg/Kg		100	71 - 128	3	30
1,2,4-Trichlorobenzene	1.00	1.00		mg/Kg		100	56 - 130	5	30
1,4-Dichlorobenzene	1.00	1.04		mg/Kg		104	80 - 120	2	30
1,4-Dioxane	25.0	27.8		mg/Kg		111	62 - 131	0	30
4-Methyl-2-pentanone	5.00	4.49		mg/Kg		90	67 - 128	1	30
1,3,5-Trimethylbenzene	1.00	0.988		mg/Kg		99	73 - 120	2	30
1,3-Dichlorobenzene	1.00	1.03		mg/Kg		103	75 - 120	2	30
2-Hexanone	5.00	4.24		mg/Kg		85	54 - 140	2	30
Acetone	7.50	4.96		mg/Kg		66	41 - 150	4	30
Benzene	1.00	1.00		mg/Kg		100	80 - 120	1	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69161/6
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	1.00	1.12		mg/Kg		112	69 - 123	0	30
Bromomethane	1.00	1.13		mg/Kg		113	45 - 140	8	30
Carbon tetrachloride	1.00	1.25		mg/Kg		125	64 - 134	0	30
Chlorobenzene	1.00	1.04		mg/Kg		104	80 - 120	1	30
Bromochloromethane	1.00	1.03		mg/Kg		103	72 - 124	1	30
Chloroethane	1.00	0.773		mg/Kg		77	43 - 135	6	30
Chloroform	1.00	1.01		mg/Kg		101	80 - 120	1	30
Chloromethane	1.00	0.785		mg/Kg		78	56 - 120	1	30
Carbon disulfide	1.00	1.06		mg/Kg		106	64 - 133	1	30
cis-1,2-Dichloroethene	1.00	1.09		mg/Kg		109	80 - 125	1	30
Bromoform	1.00	1.32	*	mg/Kg		132	51 - 127	1	30
cis-1,3-Dichloropropene	1.00	1.11		mg/Kg		111	66 - 120	0	30
Bromodichloromethane	1.00	1.15		mg/Kg		115	70 - 120	3	30
Cyclohexane	1.00	0.957		mg/Kg		96	58 - 126	1	30
1,1-Dichloroethane	1.00	0.987		mg/Kg		99	79 - 120	2	30
1,1-Dichloroethene	1.00	1.05		mg/Kg		105	73 - 129	1	30
Dibromochloromethane	1.00	1.20		mg/Kg		120	69 - 125	2	30
Dichlorodifluoromethane	1.00	0.985		mg/Kg		99	21 - 127	7	30
1,2-Dichloropropane	1.00	1.01		mg/Kg		101	80 - 120	2	30
Ethylbenzene	1.00	0.989		mg/Kg		99	78 - 120	0	30
2-Butanone	7.50	5.21		mg/Kg		70	57 - 128	4	30
Freon 113	1.00	1.02		mg/Kg		102	64 - 135	0	30
1,1,2-Trichloroethane	1.00	1.07		mg/Kg		107	80 - 120	2	30
2-Nitropropane	1.00	2.44	*	mg/Kg		244	27 - 183	2	30
m&p-Xylene	2.00	2.07		mg/Kg		103	80 - 120	1	30
Methyl acetate	1.00	0.861		mg/Kg		86	67 - 128	12	30
1,1,2,2-Tetrachloroethane	1.00	0.961		mg/Kg		96	69 - 125	4	30
Methyl tertiary butyl ether	1.00	0.958		mg/Kg		96	72 - 120	1	30
1,2,3-Trichlorobenzene	1.00	0.889		mg/Kg		89	57 - 131	5	30
Methylcyclohexane	1.00	1.04		mg/Kg		104	61 - 124	2	30
Methylene Chloride	1.00	1.01		mg/Kg		101	76 - 122	2	30
1,2-Dichlorobenzene	1.00	1.00		mg/Kg		100	76 - 120	2	30
1,2-Dibromo-3-Chloropropane	1.00	0.809		mg/Kg		81	48 - 134	2	30
Isopropylbenzene	1.00	1.01		mg/Kg		101	77 - 120	2	30
o-Xylene	1.00	1.01		mg/Kg		101	75 - 120	3	30
Styrene	1.00	1.03		mg/Kg		103	76 - 120	2	30
Cyclohexanone	25.0	23.1		mg/Kg		92	47 - 136	0	30
Tetrachloroethene	1.00	1.10		mg/Kg		110	73 - 120	1	30
Isobutyl alcohol	25.0	22.8		mg/Kg		91	69 - 129	8	30
Naphthalene	1.00	0.806		mg/Kg		81	48 - 130	6	30
Toluene	1.00	1.02		mg/Kg		102	80 - 120	2	30
n-Butanol	50.0	59.4		mg/Kg		119	63 - 123	3	30
trans-1,2-Dichloroethene	1.00	1.05		mg/Kg		105	80 - 126	3	30
n-Butylbenzene	1.00	0.975		mg/Kg		97	71 - 121	5	30
trans-1,3-Dichloropropene	1.00	1.09		mg/Kg		109	68 - 122	1	30
n-Heptane	1.00	1.04		mg/Kg		104	50 - 141	2	30
Trichloroethene	1.00	1.02		mg/Kg		102	80 - 120	1	30
Trichlorofluoromethane	1.00	0.935		mg/Kg		93	55 - 134	0	30
p-Isopropyltoluene	1.00	1.01		mg/Kg		101	72 - 120	3	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69161/6
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride			1.00	0.874		mg/Kg		87	52 - 120	1	30
sec-Butylbenzene			1.00	0.990		mg/Kg		99	72 - 120	3	30
t-Butyl alcohol			10.0	10.2		mg/Kg		102	74 - 121	4	30
tert-Butylbenzene			1.00	1.04		mg/Kg		104	68 - 120	2	30
Tetrahydrofuran			5.00	4.31		mg/Kg		86	71 - 127	2	30
Xylenes, Total			3.00	3.08		mg/Kg		103	75 - 120	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*54 - 135*
4-Bromofluorobenzene (Surr)	*93*		*50 - 131*
Dibromofluoromethane (Surr)	*102*		*50 - 141*
Toluene-d8 (Surr)	*100*		*52 - 141*

Lab Sample ID: LCSD 410-69161/8
Matrix: Solid
Analysis Batch: 69161

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetonitrile			7.50	6.83		mg/Kg		91	61 - 120	3	30
Chlorodifluoromethane			1.00	0.833		mg/Kg		83	60 - 133	3	30
Ethyl acetate			1.00	0.893		mg/Kg		89	65 - 133	1	30
Ethyl ether			1.00	1.05		mg/Kg		105	59 - 135	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*54 - 135*
4-Bromofluorobenzene (Surr)	*90*		*50 - 131*
Dibromofluoromethane (Surr)	*96*		*50 - 141*
Toluene-d8 (Surr)	*94*		*52 - 141*

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
1,2,4-Trimethylbenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2-Dichloroethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
1,2,4-Trichlorobenzene	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
1,4-Dichlorobenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
1,4-Dioxane	ND		0.25	0.037	mg/Kg			11/24/20 11:24	1
4-Methyl-2-pentanone	ND		0.010	0.0010	mg/Kg			11/24/20 11:24	1
1,3,5-Trimethylbenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,3-Dichlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
2-Hexanone	ND		0.010	0.0010	mg/Kg			11/24/20 11:24	1
Acetone	ND		0.020	0.0060	mg/Kg			11/24/20 11:24	1
Benzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1,1-Trichloroethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Bromomethane	ND		0.0050	0.00070	mg/Kg			11/24/20 11:24	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Chlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Bromochloromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Chloroethane	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Chloroform	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Chloromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Carbon disulfide	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
cis-1,2-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Bromoform	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
cis-1,3-Dichloropropene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Bromodichloromethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Cyclohexane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1-Dichloroethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Dibromochloromethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Dichlorodifluoromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
1,2-Dichloropropane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Ethylbenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
2-Butanone	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
Freon 113	ND		0.010	0.00060	mg/Kg			11/24/20 11:24	1
1,1,2-Trichloroethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
2-Nitropropane	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
m&p-Xylene	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Methyl acetate	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
1,1,2,2-Tetrachloroethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Methyl tertiary butyl ether	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2,3-Trichlorobenzene	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
Methylcyclohexane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Methylene Chloride	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
1,2-Dichlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2-Dibromo-3-Chloropropane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Acetonitrile	ND		0.10	0.025	mg/Kg			11/24/20 11:24	1
Isopropylbenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
o-Xylene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Chlorodifluoromethane	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
Styrene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Cyclohexanone	ND		0.25	0.025	mg/Kg			11/24/20 11:24	1
Ethyl acetate	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Ethyl ether	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Tetrachloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Isobutyl alcohol	ND		0.25	0.038	mg/Kg			11/24/20 11:24	1
Naphthalene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
Toluene	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
n-Butanol	ND		0.25	0.056	mg/Kg			11/24/20 11:24	1
trans-1,2-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
n-Butylbenzene	ND		0.0080	0.0030	mg/Kg			11/24/20 11:24	1
trans-1,3-Dichloropropene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
n-Heptane	ND		0.0080	0.0030	mg/Kg			11/24/20 11:24	1
Trichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichlorofluoromethane	ND		0.0050	0.00070	mg/Kg			11/24/20 11:24	1
p-Isopropyltoluene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
Vinyl chloride	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
sec-Butylbenzene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
t-Butyl alcohol	ND		0.10	0.015	mg/Kg			11/24/20 11:24	1
tert-Butylbenzene	ND		0.0050	0.00080	mg/Kg			11/24/20 11:24	1
Tetrahydrofuran	ND		0.0080	0.0010	mg/Kg			11/24/20 11:24	1
Xylenes, Total	ND		0.010	0.0014	mg/Kg			11/24/20 11:24	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*					*11/24/20 11:24*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*54 - 135*		*11/24/20 11:24*	*1*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*		*11/24/20 11:24*	*1*
Dibromofluoromethane (Surr)	*100*		*50 - 141*		*11/24/20 11:24*	*1*
Toluene-d8 (Surr)	*101*		*52 - 141*		*11/24/20 11:24*	*1*

Lab Sample ID: LCS 410-69809/5
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	0.0200	0.0215		mg/Kg		107	76 - 120
1,2,4-Trimethylbenzene	0.0200	0.0223		mg/Kg		111	73 - 120
1,2-Dichloroethane	0.0200	0.0215		mg/Kg		107	71 - 128
1,2,4-Trichlorobenzene	0.0200	0.0219		mg/Kg		109	56 - 130
1,4-Dichlorobenzene	0.0200	0.0216		mg/Kg		108	80 - 120
1,4-Dioxane	0.500	0.559		mg/Kg		112	62 - 131
4-Methyl-2-pentanone	0.100	0.109		mg/Kg		109	67 - 128
1,3,5-Trimethylbenzene	0.0200	0.0222		mg/Kg		111	73 - 120
1,3-Dichlorobenzene	0.0200	0.0217		mg/Kg		109	75 - 120
2-Hexanone	0.100	0.108		mg/Kg		108	54 - 140
Acetone	0.150	0.142		mg/Kg		95	41 - 150
Benzene	0.0200	0.0211		mg/Kg		105	80 - 120
1,1,1-Trichloroethane	0.0200	0.0212		mg/Kg		106	69 - 123
Bromomethane	0.0200	0.0219		mg/Kg		110	45 - 140
Carbon tetrachloride	0.0200	0.0211		mg/Kg		105	64 - 134
Chlorobenzene	0.0200	0.0212		mg/Kg		106	80 - 120
Bromochloromethane	0.0200	0.0210		mg/Kg		105	72 - 124
Chloroethane	0.0200	0.0205		mg/Kg		102	43 - 135
Chloroform	0.0200	0.0217		mg/Kg		109	80 - 120
Chloromethane	0.0200	0.0178		mg/Kg		89	56 - 120
Carbon disulfide	0.0200	0.0214		mg/Kg		107	64 - 133
cis-1,2-Dichloroethene	0.0200	0.0222		mg/Kg		111	80 - 125
Bromoform	0.0200	0.0195		mg/Kg		98	51 - 127
cis-1,3-Dichloropropene	0.0200	0.0210		mg/Kg		105	66 - 120
Bromodichloromethane	0.0200	0.0208		mg/Kg		104	70 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69809/5
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyclohexane	0.0200	0.0209		mg/Kg		105	58 - 126
1,1-Dichloroethane	0.0200	0.0214		mg/Kg		107	79 - 120
1,1-Dichloroethene	0.0200	0.0226		mg/Kg		113	73 - 129
Dibromochloromethane	0.0200	0.0212		mg/Kg		106	69 - 125
Dichlorodifluoromethane	0.0200	0.0144		mg/Kg		72	21 - 127
1,2-Dichloropropane	0.0200	0.0218		mg/Kg		109	80 - 120
Ethylbenzene	0.0200	0.0217		mg/Kg		109	78 - 120
2-Butanone	0.150	0.155		mg/Kg		104	57 - 128
Freon 113	0.0200	0.0189		mg/Kg		95	64 - 135
1,1,2-Trichloroethane	0.0200	0.0219		mg/Kg		110	80 - 120
2-Nitropropane	0.0200	0.0166		mg/Kg		83	27 - 183
m&p-Xylene	0.0400	0.0432		mg/Kg		108	80 - 120
Methyl acetate	0.0200	0.0193		mg/Kg		97	67 - 128
1,1,2,2-Tetrachloroethane	0.0200	0.0217		mg/Kg		109	69 - 125
Methyl tertiary butyl ether	0.0200	0.0213		mg/Kg		106	72 - 120
1,2,3-Trichlorobenzene	0.0200	0.0221		mg/Kg		111	57 - 131
Methylcyclohexane	0.0200	0.0195		mg/Kg		98	61 - 124
Methylene Chloride	0.0200	0.0209		mg/Kg		104	76 - 122
1,2-Dichlorobenzene	0.0200	0.0216		mg/Kg		108	76 - 120
1,2-Dibromo-3-Chloropropane	0.0200	0.0206		mg/Kg		103	48 - 134
Isopropylbenzene	0.0200	0.0224		mg/Kg		112	77 - 120
o-Xylene	0.0200	0.0211		mg/Kg		106	75 - 120
Styrene	0.0200	0.0207		mg/Kg		104	76 - 120
Cyclohexanone	0.500	0.379		mg/Kg		76	47 - 136
Tetrachloroethene	0.0200	0.0208		mg/Kg		104	73 - 120
Isobutyl alcohol	0.500	0.519		mg/Kg		104	69 - 129
Naphthalene	0.0200	0.0218		mg/Kg		109	48 - 130
Toluene	0.0200	0.0214		mg/Kg		107	80 - 120
n-Butanol	1.00	1.01		mg/Kg		101	63 - 123
trans-1,2-Dichloroethene	0.0200	0.0216		mg/Kg		108	80 - 126
n-Butylbenzene	0.0200	0.0207		mg/Kg		103	71 - 121
trans-1,3-Dichloropropene	0.0200	0.0209		mg/Kg		104	68 - 122
n-Heptane	0.0200	0.0210		mg/Kg		105	50 - 141
Trichloroethene	0.0200	0.0213		mg/Kg		106	80 - 120
Trichlorofluoromethane	0.0200	0.0186		mg/Kg		93	55 - 134
p-Isopropyltoluene	0.0200	0.0219		mg/Kg		109	72 - 120
Vinyl chloride	0.0200	0.0182		mg/Kg		91	52 - 120
sec-Butylbenzene	0.0200	0.0215		mg/Kg		108	72 - 120
t-Butyl alcohol	0.200	0.207		mg/Kg		103	74 - 121
tert-Butylbenzene	0.0200	0.0200		mg/Kg		100	68 - 120
Tetrahydrofuran	0.100	0.104		mg/Kg		104	71 - 127
Xylenes, Total	0.0600	0.0643		mg/Kg		107	75 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*54 - 135*
4-Bromofluorobenzene (Surr)	*100*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*101*		*52 - 141*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69809/7
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Acetonitrile			0.150	0.127		mg/Kg		85	61 - 120		
Chlorodifluoromethane			0.0200	0.0182		mg/Kg		91	60 - 133		
Ethyl acetate			0.0200	0.0237		mg/Kg		118	65 - 133		
Ethyl ether			0.0200	0.0252		mg/Kg		126	59 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*106*		*54 - 135*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*100*		*52 - 141*

Lab Sample ID: LCSD 410-69809/6
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane			0.0200	0.0206		mg/Kg		103	76 - 120	4	30
1,2,4-Trimethylbenzene			0.0200	0.0217		mg/Kg		109	73 - 120	2	30
1,2-Dichloroethane			0.0200	0.0204		mg/Kg		102	71 - 128	5	30
1,2,4-Trichlorobenzene			0.0200	0.0213		mg/Kg		106	56 - 130	3	30
1,4-Dichlorobenzene			0.0200	0.0208		mg/Kg		104	80 - 120	4	30
1,4-Dioxane			0.500	0.498		mg/Kg		100	62 - 131	12	30
4-Methyl-2-pentanone			0.100	0.102		mg/Kg		102	67 - 128	7	30
1,3,5-Trimethylbenzene			0.0200	0.0216		mg/Kg		108	73 - 120	3	30
1,3-Dichlorobenzene			0.0200	0.0207		mg/Kg		103	75 - 120	5	30
2-Hexanone			0.100	0.101		mg/Kg		101	54 - 140	7	30
Acetone			0.150	0.142		mg/Kg		95	41 - 150	0	30
Benzene			0.0200	0.0206		mg/Kg		103	80 - 120	2	30
1,1,1-Trichloroethane			0.0200	0.0208		mg/Kg		104	69 - 123	2	30
Bromomethane			0.0200	0.0210		mg/Kg		105	45 - 140	4	30
Carbon tetrachloride			0.0200	0.0207		mg/Kg		104	64 - 134	2	30
Chlorobenzene			0.0200	0.0208		mg/Kg		104	80 - 120	2	30
Bromochloromethane			0.0200	0.0201		mg/Kg		101	72 - 124	4	30
Chloroethane			0.0200	0.0201		mg/Kg		100	43 - 135	2	30
Chloroform			0.0200	0.0208		mg/Kg		104	80 - 120	4	30
Chloromethane			0.0200	0.0174		mg/Kg		87	56 - 120	2	30
Carbon disulfide			0.0200	0.0208		mg/Kg		104	64 - 133	3	30
cis-1,2-Dichloroethene			0.0200	0.0220		mg/Kg		110	80 - 125	1	30
Bromoform			0.0200	0.0183		mg/Kg		91	51 - 127	7	30
cis-1,3-Dichloropropene			0.0200	0.0201		mg/Kg		101	66 - 120	4	30
Bromodichloromethane			0.0200	0.0204		mg/Kg		102	70 - 120	2	30
Cyclohexane			0.0200	0.0208		mg/Kg		104	58 - 126	0	30
1,1-Dichloroethane			0.0200	0.0210		mg/Kg		105	79 - 120	2	30
1,1-Dichloroethene			0.0200	0.0223		mg/Kg		112	73 - 129	1	30
Dibromochloromethane			0.0200	0.0205		mg/Kg		102	69 - 125	3	30
Dichlorodifluoromethane			0.0200	0.0140		mg/Kg		70	21 - 127	3	30
1,2-Dichloropropane			0.0200	0.0211		mg/Kg		105	80 - 120	3	30
Ethylbenzene			0.0200	0.0212		mg/Kg		106	78 - 120	2	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69809/6
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2-Butanone	0.150	0.144		mg/Kg		96	57 - 128	8	30
Freon 113	0.0200	0.0191		mg/Kg		96	64 - 135	1	30
1,1,2-Trichloroethane	0.0200	0.0211		mg/Kg		106	80 - 120	4	30
2-Nitropropane	0.0200	0.0181		mg/Kg		91	27 - 183	8	30
m&p-Xylene	0.0400	0.0419		mg/Kg		105	80 - 120	3	30
Methyl acetate	0.0200	0.0177		mg/Kg		89	67 - 128	9	30
1,1,2,2-Tetrachloroethane	0.0200	0.0203		mg/Kg		102	69 - 125	7	30
Methyl tertiary butyl ether	0.0200	0.0200		mg/Kg		100	72 - 120	6	30
1,2,3-Trichlorobenzene	0.0200	0.0211		mg/Kg		106	57 - 131	5	30
Methylcyclohexane	0.0200	0.0192		mg/Kg		96	61 - 124	2	30
Methylene Chloride	0.0200	0.0206		mg/Kg		103	76 - 122	1	30
1,2-Dichlorobenzene	0.0200	0.0209		mg/Kg		105	76 - 120	3	30
1,2-Dibromo-3-Chloropropane	0.0200	0.0196		mg/Kg		98	48 - 134	5	30
Isopropylbenzene	0.0200	0.0219		mg/Kg		109	77 - 120	2	30
o-Xylene	0.0200	0.0205		mg/Kg		103	75 - 120	3	30
Styrene	0.0200	0.0201		mg/Kg		101	76 - 120	3	30
Cyclohexanone	0.500	0.354		mg/Kg		71	47 - 136	7	30
Tetrachloroethene	0.0200	0.0205		mg/Kg		102	73 - 120	2	30
Isobutyl alcohol	0.500	0.490		mg/Kg		98	69 - 129	6	30
Naphthalene	0.0200	0.0204		mg/Kg		102	48 - 130	7	30
Toluene	0.0200	0.0206		mg/Kg		103	80 - 120	4	30
n-Butanol	1.00	0.938		mg/Kg		94	63 - 123	7	30
trans-1,2-Dichloroethene	0.0200	0.0212		mg/Kg		106	80 - 126	2	30
n-Butylbenzene	0.0200	0.0203		mg/Kg		101	71 - 121	2	30
trans-1,3-Dichloropropene	0.0200	0.0202		mg/Kg		101	68 - 122	3	30
n-Heptane	0.0200	0.0208		mg/Kg		104	50 - 141	1	30
Trichloroethene	0.0200	0.0209		mg/Kg		104	80 - 120	2	30
Trichlorofluoromethane	0.0200	0.0183		mg/Kg		92	55 - 134	2	30
p-Isopropyltoluene	0.0200	0.0211		mg/Kg		105	72 - 120	4	30
Vinyl chloride	0.0200	0.0181		mg/Kg		91	52 - 120	1	30
sec-Butylbenzene	0.0200	0.0212		mg/Kg		106	72 - 120	2	30
t-Butyl alcohol	0.200	0.194		mg/Kg		97	74 - 121	6	30
tert-Butylbenzene	0.0200	0.0199		mg/Kg		99	68 - 120	0	30
Tetrahydrofuran	0.100	0.101		mg/Kg		101	71 - 127	3	30
Xylenes, Total	0.0600	0.0624		mg/Kg		104	75 - 120	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*54 - 135*
4-Bromofluorobenzene (Surr)	*100*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*100*		*52 - 141*

Lab Sample ID: LCSD 410-69809/8
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetonitrile	0.150	0.144		mg/Kg		96	61 - 120	12	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69809/8
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chlorodifluoromethane			0.0200	0.0229		mg/Kg		115	60 - 133	23	30
Ethyl acetate			0.0200	0.0201		mg/Kg		101	65 - 133	16	30
Ethyl ether			0.0200	0.0240		mg/Kg		120	59 - 135	5	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*54 - 135*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*101*		*52 - 141*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 410-67649/1-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 67649

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.037	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
1,2,4,5-Tetrachlorobenzene	ND		0.037	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2,2'-oxybis[1-chloropropane]	ND		0.043	0.020	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2,3,4,6-Tetrachlorophenol	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2,4,5-Trichlorophenol	ND		0.067	0.030	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2,4,6-Trichlorophenol	ND		0.057	0.027	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2,4-Dichlorophenol	ND		0.043	0.020	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2,4-Dimethylphenol	ND		0.067	0.030	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2,4-Dinitrophenol	ND		1.0	0.33	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2,4-Dinitrotoluene	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2,6-Dinitrotoluene	ND		0.050	0.023	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2-Chloronaphthalene	ND		0.033	0.0067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2-Chlorophenol	ND		0.037	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2-Methylnaphthalene	ND		0.033	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2-Methylphenol	ND		0.067	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2-Nitroaniline	ND		0.050	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
2-Nitrophenol	ND		0.057	0.027	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
3,3'-Dichlorobenzidine	ND		0.33	0.10	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
3-Nitroaniline	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
4,6-Dinitro-2-methylphenol	ND		0.50	0.23	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
4-Bromophenyl-phenylether	ND		0.050	0.023	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
4-Chloro-3-methylphenol	ND		0.050	0.023	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
3,4-Methylphenol	ND		0.050	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
4-Nitroaniline	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
4-Nitrophenol	ND		0.50	0.17	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Acenaphthene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Acenaphthylene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Acetophenone	ND		0.050	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Anthracene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Atrazine	ND		0.43	0.20	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Benzaldehyde	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Benzo[a]anthracene	ND		0.017	0.0067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-67649/1-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 67649

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]pyrene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Benzo[b]fluoranthene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Benzo[g,h,i]perylene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Benzo[k]fluoranthene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Butylbenzylphthalate	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Caprolactam	ND		0.17	0.033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Carbazole	ND		0.037	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Chrysene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Di-n-butyl phthalate	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Di-n-octyl phthalate	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Dibenz(a,h)anthracene	ND		0.017	0.0067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Dibenzofuran	ND		0.037	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Diethyl phthalate	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
4-Chloroaniline	ND		0.17	0.033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Dimethyl phthalate	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Fluoranthene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
4-Chlorophenyl-phenyl ether	ND		0.043	0.020	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Fluorene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Hexachlorobenzene	ND		0.017	0.0067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Hexachlorobutadiene	ND		0.077	0.037	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Hexachlorocyclopentadiene	ND		0.50	0.20	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Hexachloroethane	ND		0.17	0.033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Indeno[1,2,3-cd]pyrene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Isophorone	ND		0.037	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
N-Nitrosodi-n-propylamine	ND		0.050	0.023	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
N-Nitrosodiphenylamine	ND		0.037	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Naphthalene	ND		0.017	0.0067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Nitrobenzene	ND		0.067	0.027	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Aniline	ND		0.50	0.17	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Phenanthrene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Phenol	ND		0.037	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Pentachlorophenol	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Pyrene	ND		0.017	0.0033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Bis(2-chloroethoxy)methane	ND		0.037	0.017	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Bis(2-chloroethyl)ether	ND		0.050	0.023	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Bis(2-ethylhexyl) phthalate	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Benzyl alcohol	ND		0.50	0.17	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Dicyclohexylamine	ND		2.0	0.67	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
n,n'-Dimethylaniline	ND		0.17	0.033	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Pyridine	ND		0.17	0.067	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
Triethylamine	ND		5.0	1.7	mg/Kg		11/18/20 16:18	11/24/20 10:59	1
1,4-Dioxane	ND		0.33	0.10	mg/Kg		11/18/20 16:18	11/24/20 10:59	1

Tentatively Identified Compound	MB *Est. Result*	MB *Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.412*	*T J*	*mg/Kg*		*1.78*		*11/18/20 16:18*	*11/24/20 10:59*	*1*
Unknown	*0.169*	*T J*	*mg/Kg*		*3.90*		*11/18/20 16:18*	*11/24/20 10:59*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-67649/1-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 67649

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	98		13 - 121	11/18/20 16:18	11/24/20 10:59	1
2-Fluorobiphenyl (Surr)	95		39 - 100	11/18/20 16:18	11/24/20 10:59	1
2-Fluorophenol (Surr)	82		26 - 96	11/18/20 16:18	11/24/20 10:59	1
Nitrobenzene-d5 (Surr)	75		32 - 97	11/18/20 16:18	11/24/20 10:59	1
p-Terphenyl-d14 (Surr)	112	S1+	45 - 108	11/18/20 16:18	11/24/20 10:59	1
Phenol-d5 (Surr)	85		27 - 104	11/18/20 16:18	11/24/20 10:59	1

Lab Sample ID: LCS 410-67649/2-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 67649

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	1.67	1.35		mg/Kg		81	59 - 106
1,2,4,5-Tetrachlorobenzene	1.67	1.37		mg/Kg		82	60 - 102
2,2'-oxybis[1-chloropropane]	1.67	1.27		mg/Kg		76	44 - 105
2,3,4,6-Tetrachlorophenol	1.67	1.50		mg/Kg		90	66 - 116
2,4,5-Trichlorophenol	1.67	1.49		mg/Kg		89	67 - 110
2,4,6-Trichlorophenol	1.67	1.52		mg/Kg		91	60 - 120
2,4-Dichlorophenol	1.67	1.42		mg/Kg		85	64 - 109
2,4-Dimethylphenol	1.67	1.42		mg/Kg		85	46 - 88
2,4-Dinitrophenol	3.33	2.73		mg/Kg		82	47 - 126
2,4-Dinitrotoluene	1.67	1.48		mg/Kg		89	67 - 115
2,6-Dinitrotoluene	1.67	1.52		mg/Kg		91	67 - 113
2-Chloronaphthalene	1.67	1.42		mg/Kg		85	56 - 112
2-Chlorophenol	1.67	1.33		mg/Kg		80	59 - 97
2-Methylnaphthalene	1.67	1.42		mg/Kg		85	63 - 101
2-Methylphenol	1.67	1.44		mg/Kg		86	56 - 105
2-Nitroaniline	1.67	1.32		mg/Kg		79	63 - 119
2-Nitrophenol	1.67	1.34		mg/Kg		81	55 - 104
3,3'-Dichlorobenzidine	3.33	1.96		mg/Kg		59	40 - 107
3-Nitroaniline	1.67	1.14		mg/Kg		69	59 - 124
4,6-Dinitro-2-methylphenol	3.33	2.82		mg/Kg		85	63 - 126
4-Bromophenyl-phenylether	1.67	1.45		mg/Kg		87	68 - 114
4-Chloro-3-methylphenol	1.67	1.48		mg/Kg		89	62 - 117
3,4-Methylphenol	1.67	1.28		mg/Kg		77	56 - 100
4-Nitroaniline	1.67	1.48		mg/Kg		89	45 - 99
4-Nitrophenol	3.33	2.86		mg/Kg		86	52 - 114
Acenaphthene	1.67	1.39		mg/Kg		83	61 - 104
Acenaphthylene	1.67	1.70		mg/Kg		102	59 - 116
Acetophenone	1.67	1.21		mg/Kg		73	54 - 95
Anthracene	1.67	1.61		mg/Kg		97	75 - 114
Atrazine	1.68	1.72		mg/Kg		102	76 - 120
Benzaldehyde	1.68	1.03		mg/Kg		61	18 - 88
Benzo[a]anthracene	1.67	1.60		mg/Kg		96	73 - 114
Benzo[a]pyrene	1.67	1.57		mg/Kg		94	76 - 113
Benzo[b]fluoranthene	1.67	1.54		mg/Kg		93	73 - 117
Benzo[g,h,i]perylene	1.67	1.59		mg/Kg		95	77 - 114
Benzo[k]fluoranthene	1.67	1.60		mg/Kg		96	66 - 122

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-67649/2-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 67649

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Butylbenzylphthalate	1.67	1.43		mg/Kg		86	62 - 123
Caprolactam	1.68	1.25		mg/Kg		74	66 - 109
Carbazole	1.67	1.61		mg/Kg		96	74 - 117
Chrysene	1.67	1.58		mg/Kg		95	66 - 111
Di-n-butyl phthalate	1.67	1.55		mg/Kg		93	70 - 126
Di-n-octyl phthalate	1.67	1.48		mg/Kg		89	60 - 133
Dibenz(a,h)anthracene	1.67	1.58		mg/Kg		95	81 - 121
Dibenzofuran	1.67	1.45		mg/Kg		87	62 - 113
Diethyl phthalate	1.67	1.46		mg/Kg		88	68 - 116
4-Chloroaniline	1.67	0.736		mg/Kg		44	38 - 90
Dimethyl phthalate	1.67	1.42		mg/Kg		85	66 - 113
Fluoranthene	1.67	1.59		mg/Kg		95	65 - 114
4-Chlorophenyl-phenyl ether	1.67	1.38		mg/Kg		83	58 - 110
Fluorene	1.67	1.43		mg/Kg		86	62 - 110
Hexachlorobenzene	1.67	1.49		mg/Kg		89	69 - 116
Hexachlorobutadiene	1.67	1.23		mg/Kg		74	49 - 106
Hexachlorocyclopentadiene	1.67	1.59		mg/Kg		95	19 - 100
Hexachloroethane	1.67	1.13		mg/Kg		68	48 - 86
Indeno[1,2,3-cd]pyrene	1.67	1.61		mg/Kg		96	71 - 122
Isophorone	1.67	1.43		mg/Kg		86	52 - 103
N-Nitrosodi-n-propylamine	1.67	1.31		mg/Kg		79	51 - 100
N-Nitrosodiphenylamine	1.42	1.33		mg/Kg		94	74 - 115
Naphthalene	1.67	1.30		mg/Kg		78	60 - 94
Nitrobenzene	1.67	1.28		mg/Kg		77	50 - 99
Aniline	1.67	1.05		mg/Kg		63	37 - 77
Phenanthrene	1.67	1.52		mg/Kg		91	74 - 112
Phenol	1.67	1.36		mg/Kg		82	54 - 100
Pentachlorophenol	3.33	3.31		mg/Kg		99	51 - 121
Pyrene	1.67	1.50		mg/Kg		90	70 - 103
Bis(2-chloroethoxy)methane	1.67	1.29		mg/Kg		77	53 - 101
Bis(2-chloroethyl)ether	1.67	1.22		mg/Kg		73	49 - 94
Bis(2-ethylhexyl) phthalate	1.67	1.46		mg/Kg		88	62 - 123
Benzyl alcohol	1.67	1.40		mg/Kg		84	44 - 109
Pyridine	3.33	1.56		mg/Kg		47	30 - 62
1,4-Dioxane	1.67	0.696		mg/Kg		42	20 - 53

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*101*		*13 - 121*
2-Fluorobiphenyl (Surr)	*84*		*39 - 100*
2-Fluorophenol (Surr)	*79*		*26 - 96*
Nitrobenzene-d5 (Surr)	*73*		*32 - 97*
p-Terphenyl-d14 (Surr)	*104*		*45 - 108*
Phenol-d5 (Surr)	*84*		*27 - 104*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-67649/5-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 67649

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dicyclohexylamine			1.67	1.15	J	mg/Kg		69	49 - 141		
n,n'-Dimethylaniline			0.842	0.521		mg/Kg		62	32 - 133		
Triethylamine			1.67	ND	*-	mg/Kg		29	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*98*		*13 - 121*
2-Fluorobiphenyl (Surr)	*93*		*39 - 100*
2-Fluorophenol (Surr)	*84*		*26 - 96*
Nitrobenzene-d5 (Surr)	*76*		*32 - 97*
p-Terphenyl-d14 (Surr)	*112*	*S1+*	*45 - 108*
Phenol-d5 (Surr)	*85*		*27 - 104*

Lab Sample ID: LCSD 410-67649/6-A
Matrix: Solid
Analysis Batch: 69801

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 67649

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dicyclohexylamine			1.67	0.883	J	mg/Kg		53	49 - 141	26	30
n,n'-Dimethylaniline			0.842	0.477		mg/Kg		57	32 - 133	9	30
Triethylamine			1.67	ND	*-	mg/Kg		25	70 - 130	15	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*87*		*13 - 121*
2-Fluorobiphenyl (Surr)	*81*		*39 - 100*
2-Fluorophenol (Surr)	*77*		*26 - 96*
Nitrobenzene-d5 (Surr)	*69*		*32 - 97*
p-Terphenyl-d14 (Surr)	*105*		*45 - 108*
Phenol-d5 (Surr)	*79*		*27 - 104*

Lab Sample ID: MB 410-68429/1-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 68429

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
1,2,4,5-Tetrachlorobenzene	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
2,2'-oxybis[1-chloropropane]	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
2,3,4,6-Tetrachlorophenol	ND		10	4.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
2,4,5-Trichlorophenol	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
2,4,6-Trichlorophenol	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
2,4-Dichlorophenol	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
2,4-Dimethylphenol	ND		10	3.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
2,4-Dinitrophenol	ND		30	14	ug/L		11/20/20 09:00	12/02/20 11:35	1
2,4-Dinitrotoluene	ND		5.0	1.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
2,6-Dinitrotoluene	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
2-Chloronaphthalene	ND		1.0	0.40	ug/L		11/20/20 09:00	12/02/20 11:35	1
2-Chlorophenol	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
2-Methylnaphthalene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-68429/1-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 68429

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylphenol	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
2-Nitroaniline	ND		5.0	2.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
2-Nitrophenol	ND		10	3.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
3,3'-Dichlorobenzidine	ND		10	3.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
3-Nitroaniline	ND		7.0	3.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
4,6-Dinitro-2-methylphenol	ND		21	8.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
4-Bromophenyl-phenylether	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
4-Chloro-3-methylphenol	ND		3.5	1.6	ug/L		11/20/20 09:00	12/02/20 11:35	1
3,4-Methylphenol	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
4-Nitroaniline	ND		3.0	0.90	ug/L		11/20/20 09:00	12/02/20 11:35	1
4-Nitrophenol	ND		30	10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Acenaphthene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Acenaphthylene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Acetophenone	ND		10	4.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Anthracene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Atrazine	ND		5.0	2.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Benzaldehyde	ND		10	3.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Benzo[a]anthracene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Benzo[a]pyrene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Benzo[b]fluoranthene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Benzo[g,h,i]perylene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Benzo[k]fluoranthene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Butylbenzylphthalate	ND		5.0	2.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Caprolactam	ND		11	5.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Carbazole	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
Chrysene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Di-n-butyl phthalate	ND		5.0	2.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Di-n-octyl phthalate	ND		11	5.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Dibenz(a,h)anthracene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Dibenzofuran	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
Diethyl phthalate	ND		5.0	2.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
4-Chloroaniline	ND		10	4.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Dimethyl phthalate	ND		5.0	2.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Fluoranthene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
4-Chlorophenyl-phenyl ether	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
Fluorene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Hexachlorobenzene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Hexachlorobutadiene	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
Hexachlorocyclopentadiene	ND		11	5.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Hexachloroethane	ND		5.0	1.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Indeno[1,2,3-cd]pyrene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Isophorone	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
N-Nitrosodi-n-propylamine	ND		3.0	0.70	ug/L		11/20/20 09:00	12/02/20 11:35	1
N-Nitrosodiphenylamine	ND		3.0	0.70	ug/L		11/20/20 09:00	12/02/20 11:35	1
Naphthalene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Nitrobenzene	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
Aniline	ND		10	3.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Phenanthrene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Phenol	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-68429/1-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 68429

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	ND		5.0	1.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Pyrene	ND		0.50	0.10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Bis(2-chloroethoxy)methane	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
Bis(2-chloroethyl)ether	ND		2.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
Bis(2-ethylhexyl) phthalate	ND		11	5.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Benzyl alcohol	ND		30	10	ug/L		11/20/20 09:00	12/02/20 11:35	1
Dicyclohexylamine	ND		20	10	ug/L		11/20/20 09:00	12/02/20 11:35	1
n,n'-Dimethylaniline	ND		1.0	0.50	ug/L		11/20/20 09:00	12/02/20 11:35	1
Pyridine	ND		5.0	2.0	ug/L		11/20/20 09:00	12/02/20 11:35	1
Triethylamine	ND		10	10	ug/L		11/20/20 09:00	12/02/20 11:35	1
1,4-Dioxane	ND		5.0	2.0	ug/L		11/20/20 09:00	12/02/20 11:35	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*11/20/20 09:00*	*12/02/20 11:35*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*83*		*10 - 150*	*11/20/20 09:00*	*12/02/20 11:35*	*1*
2-Fluorobiphenyl (Surr)	*76*		*44 - 102*	*11/20/20 09:00*	*12/02/20 11:35*	*1*
2-Fluorophenol (Surr)	*45*		*10 - 84*	*11/20/20 09:00*	*12/02/20 11:35*	*1*
Nitrobenzene-d5 (Surr)	*74*		*23 - 128*	*11/20/20 09:00*	*12/02/20 11:35*	*1*
p-Terphenyl-d14 (Surr)	*88*		*31 - 113*	*11/20/20 09:00*	*12/02/20 11:35*	*1*
Phenol-d5 (Surr)	*35*		*10 - 67*	*11/20/20 09:00*	*12/02/20 11:35*	*1*

Lab Sample ID: LCS 410-68429/2-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 68429

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	50.0	39.0		ug/L		78	50 - 110
1,2,4,5-Tetrachlorobenzene	50.0	37.7		ug/L		75	32 - 113
2,2'-oxybis[1-chloropropane]	50.0	39.6		ug/L		79	41 - 118
2,3,4,6-Tetrachlorophenol	50.0	44.8		ug/L		90	64 - 130
2,4,5-Trichlorophenol	50.0	47.2		ug/L		94	59 - 126
2,4,6-Trichlorophenol	50.0	45.6		ug/L		91	59 - 129
2,4-Dichlorophenol	50.0	45.2		ug/L		90	51 - 123
2,4-Dimethylphenol	50.0	38.7		ug/L		77	43 - 102
2,4-Dinitrophenol	100	74.7		ug/L		75	30 - 143
2,4-Dinitrotoluene	50.0	41.9		ug/L		84	52 - 128
2,6-Dinitrotoluene	50.0	45.3		ug/L		91	61 - 121
2-Chloronaphthalene	50.0	38.9		ug/L		78	43 - 110
2-Chlorophenol	50.0	42.4		ug/L		85	46 - 109
2-Methylnaphthalene	50.0	41.2		ug/L		82	45 - 108
2-Methylphenol	50.0	41.2		ug/L		82	41 - 113
2-Nitroaniline	50.0	46.6		ug/L		93	60 - 123
2-Nitrophenol	50.0	43.8		ug/L		88	53 - 123
3,3'-Dichlorobenzidine	100	78.8		ug/L		79	42 - 107
3-Nitroaniline	50.0	37.5		ug/L		75	54 - 112
4,6-Dinitro-2-methylphenol	100	88.3		ug/L		88	49 - 138

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-68429/2-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 68429

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Bromophenyl-phenylether	50.0	44.1		ug/L		88	54 - 121
4-Chloro-3-methylphenol	50.0	45.6		ug/L		91	52 - 126
3,4-Methylphenol	50.0	38.0		ug/L		76	41 - 109
4-Nitroaniline	50.0	39.8		ug/L		80	49 - 107
4-Nitrophenol	100	49.0		ug/L		49	23 - 89
Acenaphthene	50.0	40.7		ug/L		81	52 - 114
Acenaphthylene	50.0	48.6		ug/L		97	55 - 117
Acetophenone	50.0	40.2		ug/L		80	51 - 119
Anthracene	50.0	45.2		ug/L		90	61 - 117
Atrazine	50.4	45.6		ug/L		90	71 - 133
Benzaldehyde	50.5	37.8		ug/L		75	39 - 119
Benzo[a]anthracene	50.0	49.1		ug/L		98	61 - 126
Benzo[a]pyrene	50.0	45.0		ug/L		90	60 - 116
Benzo[b]fluoranthene	50.0	43.2		ug/L		86	61 - 119
Benzo[g,h,i]perylene	50.0	48.2		ug/L		96	54 - 120
Benzo[k]fluoranthene	50.0	49.2		ug/L		98	69 - 122
Butylbenzylphthalate	50.0	32.9		ug/L		66	11 - 125
Caprolactam	50.5	11.2		ug/L		22	12 - 40
Carbazole	50.0	44.8		ug/L		90	64 - 127
Chrysene	50.0	48.2		ug/L		96	65 - 121
Di-n-butyl phthalate	50.0	41.8		ug/L		84	43 - 118
Di-n-octyl phthalate	50.0	43.8		ug/L		88	48 - 129
Dibenz(a,h)anthracene	50.0	47.5		ug/L		95	57 - 124
Dibenzofuran	50.0	42.1		ug/L		84	60 - 112
Diethyl phthalate	50.0	36.1		ug/L		72	19 - 121
4-Chloroaniline	50.0	35.6		ug/L		71	45 - 93
Dimethyl phthalate	50.0	26.0		ug/L		52	10 - 134
Fluoranthene	50.0	44.9		ug/L		90	63 - 122
4-Chlorophenyl-phenyl ether	50.0	40.6		ug/L		81	47 - 121
Fluorene	50.0	42.5		ug/L		85	56 - 115
Hexachlorobenzene	50.0	44.9		ug/L		90	55 - 123
Hexachlorobutadiene	50.0	33.7		ug/L		67	20 - 108
Hexachlorocyclopentadiene	50.0	22.3	*+	ug/L		45	10 - 42
Hexachloroethane	50.0	31.1		ug/L		62	22 - 88
Indeno[1,2,3-cd]pyrene	50.0	46.9		ug/L		94	52 - 121
Isophorone	50.0	45.8		ug/L		92	55 - 122
N-Nitrosodi-n-propylamine	50.0	43.4		ug/L		87	52 - 123
N-Nitrosodiphenylamine	42.5	38.0		ug/L		89	60 - 126
Naphthalene	50.0	39.2		ug/L		78	51 - 102
Nitrobenzene	50.0	40.6		ug/L		81	52 - 119
Aniline	50.0	30.6		ug/L		61	26 - 75
Phenanthrene	50.0	43.5		ug/L		87	65 - 113
Phenol	50.0	24.6		ug/L		49	22 - 69
Pentachlorophenol	100	88.9		ug/L		89	54 - 131
Pyrene	50.0	45.0		ug/L		90	65 - 115
Bis(2-chloroethoxy)methane	50.0	41.2		ug/L		82	51 - 120
Bis(2-chloroethyl)ether	50.0	41.1		ug/L		82	50 - 110
Bis(2-ethylhexyl) phthalate	50.0	45.8		ug/L		92	50 - 127
Benzyl alcohol	50.0	43.5		ug/L		87	56 - 115

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-68429/2-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 68429

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pyridine	100	41.3		ug/L		41	23 - 64
1,4-Dioxane	50.0	20.2		ug/L		40	21 - 64

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*82*		*10 - 150*
2-Fluorobiphenyl (Surr)	*72*		*44 - 102*
2-Fluorophenol (Surr)	*55*		*10 - 84*
Nitrobenzene-d5 (Surr)	*75*		*23 - 128*
p-Terphenyl-d14 (Surr)	*86*		*31 - 113*
Phenol-d5 (Surr)	*43*		*10 - 67*

Method: 8315A - Carbonyl Compounds by HPLC

Lab Sample ID: MB 410-66613/1-A
Matrix: Water
Analysis Batch: 66726

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 66613

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/16/20 17:00	11/19/20 00:27	1
Formaldehyde	ND		50	20	ug/L		11/16/20 17:00	11/19/20 00:27	1
Glutaraldehyde	ND		50	30	ug/L		11/16/20 17:00	11/19/20 00:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*88*		*39 - 153*	*11/16/20 17:00*	*11/19/20 00:27*	*1*

Lab Sample ID: LCS 410-66613/2-A
Matrix: Water
Analysis Batch: 66726

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 66613

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetaldehyde	499	485		ug/L		97	76 - 119
Formaldehyde	503	480		ug/L		95	77 - 122
Glutaraldehyde	503	559		ug/L		111	79 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Butyraldehyde	*95*		*39 - 153*

Lab Sample ID: LCSD 410-66613/3-A
Matrix: Water
Analysis Batch: 66726

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 66613

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetaldehyde	499	465		ug/L		93	76 - 119	4	30
Formaldehyde	503	474		ug/L		94	77 - 122	1	30
Glutaraldehyde	503	511		ug/L		102	79 - 127	9	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Butyraldehyde	*82*		*39 - 153*

Method: 8315A - Carbonyl Compounds by HPLC

Lab Sample ID: MB 410-66658/1-A
Matrix: Solid
Analysis Batch: 66726

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 66658

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.050	0.025	mg/Kg		11/17/20 17:30	11/18/20 22:31	1
Formaldehyde	ND		0.075	0.025	mg/Kg		11/17/20 17:30	11/18/20 22:31	1
Glutaraldehyde	ND		0.050	0.025	mg/Kg		11/17/20 17:30	11/18/20 22:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*115*		*77 - 133*	*11/17/20 17:30*	*11/18/20 22:31*	*1*

Lab Sample ID: LCS 410-66658/2-A
Matrix: Solid
Analysis Batch: 66726

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 66658

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetaldehyde	0.499	0.512		mg/Kg		103	83 - 115
Formaldehyde	0.503	0.465		mg/Kg		93	81 - 120
Glutaraldehyde	0.503	0.521		mg/Kg		104	84 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Butyraldehyde	*112*		*77 - 133*

Lab Sample ID: 410-20914-1 MS
Matrix: Soil
Analysis Batch: 66726

Client Sample ID: B55-PDI-13 (6-8)
Prep Type: Total/NA
Prep Batch: 66658

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetaldehyde	0.058	J	0.600	0.695		mg/Kg	☼	106	83 - 115
Formaldehyde	1.4	E F1	0.605	1.43	E F1	mg/Kg	☼	0.2	81 - 120
Glutaraldehyde	ND		0.605	0.650		mg/Kg	☼	107	84 - 123

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Butyraldehyde	*116*		*77 - 133*

Lab Sample ID: 410-20914-1 MSD
Matrix: Soil
Analysis Batch: 66726

Client Sample ID: B55-PDI-13 (6-8)
Prep Type: Total/NA
Prep Batch: 66658

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetaldehyde	ND		0.600	0.681		mg/Kg	☼	114	83 - 115	2	50
Formaldehyde	1.4	F1	0.605	1.43	E 4	mg/Kg	☼	-4487	81 - 120	NC	50
Glutaraldehyde	ND		0.605	0.621		mg/Kg	☼	5 103	84 - 123	4	50

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Butyraldehyde	*102*		*77 - 133*

GC/MS VOA

Prep Batch: 66096

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-2	B55-PDI-13 (12-12.5)	Total/NA	Soil	5035	
410-20914-3	B55-PDI-07 (13-14)	Total/NA	Soil	5035	
410-20914-6	B55-PDI-SB-15 (8-9)	Total/NA	Soil	5035	

Prep Batch: 66098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-1	B55-PDI-13 (6-8)	Total/NA	Soil	5035	
410-20914-4	B55-PDI-11 (5-6)	Total/NA	Soil	5035	

Analysis Batch: 69161

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-1	B55-PDI-13 (6-8)	Total/NA	Soil	8260C	66098
410-20914-4	B55-PDI-11 (5-6)	Total/NA	Soil	8260C	66098
MB 410-69161/9	Method Blank	Total/NA	Solid	8260C	
LCS 410-69161/5	Lab Control Sample	Total/NA	Solid	8260C	
LCS 410-69161/7	Lab Control Sample	Total/NA	Solid	8260C	
LCSD 410-69161/6	Lab Control Sample Dup	Total/NA	Solid	8260C	
LCSD 410-69161/8	Lab Control Sample Dup	Total/NA	Solid	8260C	

Analysis Batch: 69809

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-2	B55-PDI-13 (12-12.5)	Total/NA	Soil	8260C	66096
410-20914-3	B55-PDI-07 (13-14)	Total/NA	Soil	8260C	66096
410-20914-6	B55-PDI-SB-15 (8-9)	Total/NA	Soil	8260C	66096
MB 410-69809/10	Method Blank	Total/NA	Solid	8260C	
LCS 410-69809/5	Lab Control Sample	Total/NA	Solid	8260C	
LCS 410-69809/7	Lab Control Sample	Total/NA	Solid	8260C	
LCSD 410-69809/6	Lab Control Sample Dup	Total/NA	Solid	8260C	
LCSD 410-69809/8	Lab Control Sample Dup	Total/NA	Solid	8260C	

GC/MS Semi VOA

Prep Batch: 67649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-1	B55-PDI-13 (6-8)	Total/NA	Soil	3546	
410-20914-1 - DL	B55-PDI-13 (6-8)	Total/NA	Soil	3546	
410-20914-2	B55-PDI-13 (12-12.5)	Total/NA	Soil	3546	
410-20914-2 - DL	B55-PDI-13 (12-12.5)	Total/NA	Soil	3546	
410-20914-3 - DL	B55-PDI-07 (13-14)	Total/NA	Soil	3546	
410-20914-3	B55-PDI-07 (13-14)	Total/NA	Soil	3546	
410-20914-4	B55-PDI-11 (5-6)	Total/NA	Soil	3546	
410-20914-6	B55-PDI-SB-15 (8-9)	Total/NA	Soil	3546	
410-20914-6 - DL	B55-PDI-SB-15 (8-9)	Total/NA	Soil	3546	
MB 410-67649/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-67649/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCS 410-67649/5-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 410-67649/6-A	Lab Control Sample Dup	Total/NA	Solid	3546	

Prep Batch: 68429

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-5	EB11132020	Total/NA	Water	3510C	

GC/MS Semi VOA (Continued)

Prep Batch: 68429 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 410-68429/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-68429/2-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 69801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-1	B55-PDI-13 (6-8)	Total/NA	Soil	8270D	67649
410-20914-2	B55-PDI-13 (12-12.5)	Total/NA	Soil	8270D	67649
410-20914-3	B55-PDI-07 (13-14)	Total/NA	Soil	8270D	67649
410-20914-4	B55-PDI-11 (5-6)	Total/NA	Soil	8270D	67649
410-20914-6	B55-PDI-SB-15 (8-9)	Total/NA	Soil	8270D	67649
MB 410-67649/1-A	Method Blank	Total/NA	Solid	8270D	67649
LCS 410-67649/2-A	Lab Control Sample	Total/NA	Solid	8270D	67649
LCS 410-67649/5-A	Lab Control Sample	Total/NA	Solid	8270D	67649
LCSD 410-67649/6-A	Lab Control Sample Dup	Total/NA	Solid	8270D	67649

Analysis Batch: 70185

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-1 - DL	B55-PDI-13 (6-8)	Total/NA	Soil	8270D	67649
410-20914-2 - DL	B55-PDI-13 (12-12.5)	Total/NA	Soil	8270D	67649
410-20914-3 - DL	B55-PDI-07 (13-14)	Total/NA	Soil	8270D	67649
410-20914-6 - DL	B55-PDI-SB-15 (8-9)	Total/NA	Soil	8270D	67649

Analysis Batch: 71928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-5	EB11132020	Total/NA	Water	8270D	68429
MB 410-68429/1-A	Method Blank	Total/NA	Water	8270D	68429
LCS 410-68429/2-A	Lab Control Sample	Total/NA	Water	8270D	68429

HPLC/IC

Prep Batch: 66613

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-5	EB11132020	Total/NA	Water	8315A Prep	
MB 410-66613/1-A	Method Blank	Total/NA	Water	8315A Prep	
LCS 410-66613/2-A	Lab Control Sample	Total/NA	Water	8315A Prep	
LCSD 410-66613/3-A	Lab Control Sample Dup	Total/NA	Water	8315A Prep	

Prep Batch: 66658

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-1 - DL	B55-PDI-13 (6-8)	Total/NA	Soil	8315A Prep	
410-20914-1	B55-PDI-13 (6-8)	Total/NA	Soil	8315A Prep	
410-20914-2	B55-PDI-13 (12-12.5)	Total/NA	Soil	8315A Prep	
410-20914-3	B55-PDI-07 (13-14)	Total/NA	Soil	8315A Prep	
410-20914-4	B55-PDI-11 (5-6)	Total/NA	Soil	8315A Prep	
410-20914-6	B55-PDI-SB-15 (8-9)	Total/NA	Soil	8315A Prep	
MB 410-66658/1-A	Method Blank	Total/NA	Solid	8315A Prep	
LCS 410-66658/2-A	Lab Control Sample	Total/NA	Solid	8315A Prep	
410-20914-1 MS	B55-PDI-13 (6-8)	Total/NA	Soil	8315A Prep	
410-20914-1 MSD	B55-PDI-13 (6-8)	Total/NA	Soil	8315A Prep	

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

HPLC/IC

Analysis Batch: 66726

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-1	B55-PDI-13 (6-8)	Total/NA	Soil	8315A	66658
410-20914-2	B55-PDI-13 (12-12.5)	Total/NA	Soil	8315A	66658
410-20914-3	B55-PDI-07 (13-14)	Total/NA	Soil	8315A	66658
410-20914-4	B55-PDI-11 (5-6)	Total/NA	Soil	8315A	66658
410-20914-5	EB11132020	Total/NA	Water	8315A	66613
410-20914-6	B55-PDI-SB-15 (8-9)	Total/NA	Soil	8315A	66658
MB 410-66613/1-A	Method Blank	Total/NA	Water	8315A	66613
MB 410-66658/1-A	Method Blank	Total/NA	Solid	8315A	66658
LCS 410-66613/2-A	Lab Control Sample	Total/NA	Water	8315A	66613
LCS 410-66658/2-A	Lab Control Sample	Total/NA	Solid	8315A	66658
LCSD 410-66613/3-A	Lab Control Sample Dup	Total/NA	Water	8315A	66613
410-20914-1 MS	B55-PDI-13 (6-8)	Total/NA	Soil	8315A	66658
410-20914-1 MSD	B55-PDI-13 (6-8)	Total/NA	Soil	8315A	66658

Analysis Batch: 68227

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-1 - DL	B55-PDI-13 (6-8)	Total/NA	Soil	8315A	66658

General Chemistry

Analysis Batch: 66671

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-20914-1	B55-PDI-13 (6-8)	Total/NA	Soil	Moisture	
410-20914-2	B55-PDI-13 (12-12.5)	Total/NA	Soil	Moisture	
410-20914-3	B55-PDI-07 (13-14)	Total/NA	Soil	Moisture	
410-20914-4	B55-PDI-11 (5-6)	Total/NA	Soil	Moisture	
410-20914-6	B55-PDI-SB-15 (8-9)	Total/NA	Soil	Moisture	

Client Sample ID: B55-PDI-13 (6-8)
Date Collected: 11/13/20 08:40
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-1
Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	66671	11/16/20 20:10	OEL4	ELLE

Client Sample ID: B55-PDI-13 (6-8)
Date Collected: 11/13/20 08:40
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-1
Matrix: Soil
Percent Solids: 83.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			66098	11/14/20 16:23	UK3O	ELLE
Total/NA	Analysis	8260C		50	69161	11/23/20 02:42	Z6JB	ELLE
Total/NA	Prep	3546			67649	11/18/20 16:18	DN9W	ELLE
Total/NA	Analysis	8270D		1	69801	11/24/20 15:02	WKV3	ELLE
Total/NA	Prep	3546	DL		67649	11/18/20 16:18	DN9W	ELLE
Total/NA	Analysis	8270D	DL	10	70185	11/25/20 18:24	ULM3	ELLE
Total/NA	Prep	8315A Prep			66658	11/17/20 17:30	DFX4	ELLE
Total/NA	Analysis	8315A		1	66726	11/18/20 23:17	GM5C	ELLE
Total/NA	Prep	8315A Prep	DL		66658	11/17/20 17:30	DFX4	ELLE
Total/NA	Analysis	8315A	DL	5	68227	11/19/20 16:50	GM5C	ELLE

Client Sample ID: B55-PDI-13 (12-12.5)
Date Collected: 11/13/20 09:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-2
Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	66671	11/16/20 20:10	OEL4	ELLE

Client Sample ID: B55-PDI-13 (12-12.5)
Date Collected: 11/13/20 09:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-2
Matrix: Soil
Percent Solids: 90.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			66096	11/14/20 16:21	UK3O	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 14:49	Z6JB	ELLE
Total/NA	Prep	3546			67649	11/18/20 16:18	DN9W	ELLE
Total/NA	Analysis	8270D		1	69801	11/24/20 15:26	WKV3	ELLE
Total/NA	Prep	3546	DL		67649	11/18/20 16:18	DN9W	ELLE
Total/NA	Analysis	8270D	DL	2	70185	11/25/20 18:48	ULM3	ELLE
Total/NA	Prep	8315A Prep			66658	11/17/20 17:30	DFX4	ELLE
Total/NA	Analysis	8315A		1	66726	11/18/20 23:29	GM5C	ELLE

Client Sample ID: B55-PDI-07 (13-14)
Date Collected: 11/13/20 09:35
Date Received: 11/14/20 10:05

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-3
Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	66671	11/16/20 20:10	OEL4	ELLE

Client Sample ID: B55-PDI-07 (13-14)

Lab Sample ID: 410-20914-3
Matrix: Soil
Percent Solids: 80.5

Date Collected: 11/13/20 09:35
Date Received: 11/14/20 10:05

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			66096	11/14/20 16:21	UK3O	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 15:11	Z6JB	ELLE
Total/NA	Prep	3546			67649	11/18/20 16:18	DN9W	ELLE
Total/NA	Analysis	8270D		1	69801	11/24/20 15:50	WKV3	ELLE
Total/NA	Prep	3546	DL		67649	11/18/20 16:18	DN9W	ELLE
Total/NA	Analysis	8270D	DL	5	70185	11/25/20 19:12	ULM3	ELLE
Total/NA	Prep	8315A Prep			66658	11/17/20 17:30	DFX4	ELLE
Total/NA	Analysis	8315A		1	66726	11/18/20 23:41	GM5C	ELLE

Client Sample ID: B55-PDI-11 (5-6)

Lab Sample ID: 410-20914-4
Matrix: Soil

Date Collected: 11/13/20 09:30
Date Received: 11/14/20 10:05

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	66671	11/16/20 20:10	OEL4	ELLE

Client Sample ID: B55-PDI-11 (5-6)

Lab Sample ID: 410-20914-4
Matrix: Soil
Percent Solids: 84.7

Date Collected: 11/13/20 09:30
Date Received: 11/14/20 10:05

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			66098	11/14/20 16:23	UK3O	ELLE
Total/NA	Analysis	8260C		50	69161	11/23/20 03:24	Z6JB	ELLE
Total/NA	Prep	3546			67649	11/18/20 16:18	DN9W	ELLE
Total/NA	Analysis	8270D		1	69801	11/24/20 16:15	WKV3	ELLE
Total/NA	Prep	8315A Prep			66658	11/17/20 17:30	DFX4	ELLE
Total/NA	Analysis	8315A		1	66726	11/18/20 23:53	GM5C	ELLE

Client Sample ID: EB11132020

Lab Sample ID: 410-20914-5
Matrix: Water

Date Collected: 11/13/20 07:00
Date Received: 11/14/20 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			68429	11/20/20 09:00	U2SJ	ELLE
Total/NA	Analysis	8270D		1	71928	12/02/20 14:50	WKV3	ELLE
Total/NA	Prep	8315A Prep			66613	11/16/20 17:00	DFX4	ELLE
Total/NA	Analysis	8315A		1	66726	11/19/20 01:01	GM5C	ELLE

Client Sample ID: B55-PDI-SB-15 (8-9)

Lab Sample ID: 410-20914-6
Matrix: Soil

Date Collected: 11/13/20 13:15
Date Received: 11/14/20 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	66671	11/16/20 20:10	OEL4	ELLE

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Client Sample ID: B55-PDI-SB-15 (8-9)

Date Collected: 11/13/20 13:15
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-6

Matrix: Soil
Percent Solids: 83.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			66096	11/14/20 16:21	UK3O	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 15:34	Z6JB	ELLE
Total/NA	Prep	3546			67649	11/18/20 16:18	DN9W	ELLE
Total/NA	Analysis	8270D		1	69801	11/24/20 16:39	WKV3	ELLE
Total/NA	Prep	3546	DL		67649	11/18/20 16:18	DN9W	ELLE
Total/NA	Analysis	8270D	DL	2	70185	11/25/20 19:37	ULM3	ELLE
Total/NA	Prep	8315A Prep			66658	11/17/20 17:30	DFX4	ELLE
Total/NA	Analysis	8315A		1	66726	11/19/20 00:04	GM5C	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New York	NELAP	10670	04-01-21

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8260C	5035	Soil	Chlorodifluoromethane
8260C	5035	Soil	Cyclohexanone
8260C	5035	Soil	Ethyl ether
8260C	5035	Soil	n-Heptane
8260C	5035	Soil	Tetrahydrofuran
8270D	3510C	Water	Dicyclohexylamine
8270D	3510C	Water	n,n'-Dimethylaniline
8270D	3510C	Water	Triethylamine
8270D	3546	Soil	Dicyclohexylamine
8270D	3546	Soil	n,n'-Dimethylaniline
8270D	3546	Soil	Triethylamine
8315A	8315A Prep	Soil	Acetaldehyde
8315A	8315A Prep	Soil	Glutaraldehyde
8315A	8315A Prep	Water	Acetaldehyde
8315A	8315A Prep	Water	Glutaraldehyde
Moisture		Soil	Percent Moisture

Method Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	ELLE
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	ELLE
8315A	Carbonyl Compounds by HPLC	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	ELLE
3546	Microwave Extraction	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE
8315A Prep	Extraction (Carbonyl Compounds)	SW846	ELLE
8315A Prep	Solid Phase Extraction (SPE)	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20914-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-20914-1	B55-PDI-13 (6-8)	Soil	11/13/20 08:40	11/14/20 10:05	
410-20914-2	B55-PDI-13 (12-12.5)	Soil	11/13/20 09:00	11/14/20 10:05	
410-20914-3	B55-PDI-07 (13-14)	Soil	11/13/20 09:35	11/14/20 10:05	
410-20914-4	B55-PDI-11 (5-6)	Soil	11/13/20 09:30	11/14/20 10:05	
410-20914-5	EB11132020	Water	11/13/20 07:00	11/14/20 10:05	
410-20914-6	B55-PDI-SB-15 (8-9)	Soil	11/13/20 13:15	11/14/20 10:05	

Environmental Analysis R ustody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-20914 Chain of Custody

ıtal use only

COC #616405

Client Information

Client: Arcadis	Acct. #:
Project Name/#: Bristol-Myers Squibb	PWSID #:
Project Manager: William McCune	P.O. #:
Sampler: Sophia Miller	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☒

For Lab Use Only
FSC:_____
SCR#:_____

Sample Identification	Collected Date	Collected Time	Grab	Composite	Matrix: Soil/Sediment	Matrix: Water	Matrix: Other	Total # of Containers	Short-List Analytes 8315A	SVOA 8270 D/E (Miniaturized)	VOC, Solid by 8260 C/D	Short-List Analytes W8315A	VOCs Water 8260C	SVOAs 8270D MINI	Remarks
BSS-PDI-13 (6-8)	11/13/20	0840		X	X			5	X	X	X				
BSS-PDI-13 (12-12.5)		0900		X	X			5	X	X	X				
BSS-PDI-07 (13-14)		0935		X	X			5	X	X	X				Date Collected is 11/11/20
BSS-PDI 11 (5-6)		0730		X	X			5	X	X	X				Date Collected is 11/12/20
EB11132020		0700	X			X		6				X	X	X	
TB20083	3/26/20	Lab Prep				X		1					X		
BSS-PDI-SB-15 (8-9)	11/13/20			X	X			5	X	X	X				

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: Standard

E-mail address: William.McCune@arcadis.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP)
Type VI (Raw Data Only)
Type III (Reduced non-CLP)
NJ DKQP
TX TRRP-13
NYSDEC Category A or B
MA MCP
CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	11/13/20	1443			
				11/14/2020	1005

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx X Other _____

Temperature upon receipt 2.7 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • FOR HELP COMPLETING FORM CHECK OUT https://www.eurofinsus.com/coc
The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919

Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 410-20914-1

Login Number: 20914
List Number: 1
Creator: Rivera-Santa, Julissa

List Source: Eurofins Lancaster Laboratories Env

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	False	Insufficient volume received for requested analysis.
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-21255-1
Client Project/Site: Bristol-Myers Squibb
Revision: 1

For:
ARCADIS U.S. Inc
One Lincoln Center
110 West Fayette St, Suite 300
Syracuse, New York 13202

Attn: William T McCune

Authorized for release by:
12/30/2020 5:06:13 PM

Megan Moeller, Client Services Group Leader
(717)556-7261
Megan.Moeller@eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

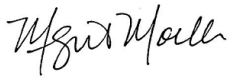
Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



Megan Moeller
Client Services Group Leader
12/30/2020 5:06:13 PM

Table of Contents

Cover Page 1
Table of Contents 3
Definitions/Glossary 4
Case Narrative 6
Detection Summary 7
Client Sample Results 9
Surrogate Summary 49
QC Sample Results 53
QC Association Summary 88
Lab Chronicle 93
Certification Summary 98
Method Summary 99
Sample Summary 100
Chain of Custody 101
Receipt Checklists 102

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*1	LCS/LCSD RPD exceeds control limits.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
F1	MS and/or MSD recovery exceeds control limits.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-21255-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-21255-1

Revision
The report being provided is a revision of the original report sent on 12/11/2020. The report (revision 1) is being revised due to: Add 1,4-Dioxane.

Receipt
The samples were received on 11/18/2020 11:46 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1º C.

Receipt Exceptions
The following sample was submitted for analysis; however, it was not listed on the Chain-of-Custody (COC): DUP111720 (410-21255-11). Per the client, this sample should not be analyzed and can be discarded.

GC/MS VOA
Method 8260C: The continuing calibration verification (CCV) associated with batch 410-70702 recovered above the upper control limit for Bromomethane, Chloroethane, Chloromethane, Dichlorodifluoromethane, Trichlorofluoromethane and Vinyl chloride. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: The continuing calibration verification (CCV) associated with batch 410-69809 recovered above the upper control limit for 1,4-Dioxane. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: The continuing calibration verification (CCV) associated with batch 410-70130 recovered above the upper control limit for 2-Nitropropane, Bromoform, cis-1,3-Dichloropropene and Bromodichloromethane. Non-detections of the affected analytes are reported. Any detections are considered estimated.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270D: The laboratory control sample (LCS) for preparation batch 410-70093 recovered outside control limits for the following analytes: Triethylamine. The associated sample(s) was re-prepared and/or re-analyzed outside holding time with acceptable results. The first set of data has been reported.

Method 8270D: The continuing calibration verification (CCV) associated with analytical batch 410-70185 recovered above the upper control limit for Benzo[a]anthracene and Benzo[b]fluoranthene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8270D: The laboratory control sample (LCS) for preparation batch 410-69548 recovered outside control limits for the following analytes: Dicyclohexylamine and Triethylamine. The associated sample(s) was re-prepared and/or re-analyzed outside holding time with acceptable results. The first set of data has been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

HPLC/IC
Method 8315A: The following samples were prepared within holding time but analyzed outside of analytical holding time :B55-PDI-SB-17 (8-9) (410-21255-8) and B55-PDI-SB-06 (12-13) (410-21255-9).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-21 — Lab Sample ID: 410-21255-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	1.3	J	20	0.70	ug/L	1		8260C	Total/NA
Acenaphthene	0.17	J	0.51	0.10	ug/L	1		8270D	Total/NA
Acenaphthylene	0.42	J	0.51	0.10	ug/L	1		8270D	Total/NA
Anthracene	0.16	J	0.51	0.10	ug/L	1		8270D	Total/NA
Benzo[a]anthracene	0.98		0.51	0.10	ug/L	1		8270D	Total/NA
Benzo[a]pyrene	1.5		0.51	0.10	ug/L	1		8270D	Total/NA
Benzo[b]fluoranthene	1.2		0.51	0.10	ug/L	1		8270D	Total/NA
Benzo[g,h,i]perylene	0.91		0.51	0.10	ug/L	1		8270D	Total/NA
Benzo[k]fluoranthene	0.53		0.51	0.10	ug/L	1		8270D	Total/NA
Chrysene	1.3		0.51	0.10	ug/L	1		8270D	Total/NA
Dicyclohexylamine	38	*-	20	10	ug/L	1		8270D	Total/NA
Fluoranthene	1.5		0.51	0.10	ug/L	1		8270D	Total/NA
Fluorene	0.18	J	0.51	0.10	ug/L	1		8270D	Total/NA
Indeno[1,2,3-cd]pyrene	0.73		0.51	0.10	ug/L	1		8270D	Total/NA
Phenanthrene	0.59		0.51	0.10	ug/L	1		8270D	Total/NA
Pyrene	2.5		0.51	0.10	ug/L	1		8270D	Total/NA

Client Sample ID: B55-PDI-SB-17 (9-10) — Lab Sample ID: 410-21255-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone	0.0025	J	0.0080	0.0016	mg/Kg	1	☼	8260C	Total/NA
Acetone	0.039		0.016	0.0048	mg/Kg	1	☼	8260C	Total/NA
Cyclohexanone	0.10	J	0.20	0.020	mg/Kg	1	☼	8260C	Total/NA
t-Butyl alcohol	0.033	J	0.080	0.012	mg/Kg	1	☼	8260C	Total/NA
Dicyclohexylamine	4.1		2.4	0.78	mg/Kg	1	☼	8270D	Total/NA
Formaldehyde	0.12		0.088	0.029	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-SB-19 (11.6-12.6) — Lab Sample ID: 410-21255-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone	0.0023	J	0.0091	0.0018	mg/Kg	1	☼	8260C	Total/NA
Acetone	0.035		0.018	0.0055	mg/Kg	1	☼	8260C	Total/NA
Carbon disulfide	0.0017	J	0.0046	0.00055	mg/Kg	1	☼	8260C	Total/NA
Cyclohexane	0.0067		0.0046	0.00046	mg/Kg	1	☼	8260C	Total/NA
Ethylbenzene	0.00079	J	0.0046	0.00037	mg/Kg	1	☼	8260C	Total/NA
Isopropylbenzene	0.00066	J	0.0046	0.00037	mg/Kg	1	☼	8260C	Total/NA
Methylcyclohexane	0.0021	J	0.0046	0.00055	mg/Kg	1	☼	8260C	Total/NA
t-Butyl alcohol	0.015	J	0.091	0.014	mg/Kg	1	☼	8260C	Total/NA
Dicyclohexylamine - DL	9.2		4.9	1.6	mg/Kg	2	☼	8270D	Total/NA
Formaldehyde	0.092	J	0.093	0.031	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-SB-18 (10.7-11.7) — Lab Sample ID: 410-21255-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	0.023		0.019	0.0058	mg/Kg	1	☼	8260C	Total/NA
Dicyclohexylamine	1.9	J	2.5	0.82	mg/Kg	1	☼	8270D	Total/NA
Formaldehyde	0.069	J	0.093	0.031	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-SB-19 (12.6-13.6) — Lab Sample ID: 410-21255-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone	0.0026	J	0.0091	0.0018	mg/Kg	1	☼	8260C	Total/NA
Acetone	0.071		0.018	0.0055	mg/Kg	1	☼	8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: B55-PDI-SB-19 (12.6-13.6) (Continued) — Lab Sample ID: 410-21255-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
t-Butyl alcohol	0.073	J	0.091	0.014	mg/Kg	1	☼	8260C	Total/NA
Dicyclohexylamine - DL	12		7.6	2.5	mg/Kg	3	☼	8270D	Total/NA
Formaldehyde	0.16		0.096	0.032	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-SB-18 (9.5-10.5) — Lab Sample ID: 410-21255-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylcyclohexane	0.55		0.31	0.037	mg/Kg	50	☼	8260C	Total/NA
n-Heptane	0.86		0.49	0.19	mg/Kg	50	☼	8260C	Total/NA
2-Methylnaphthalene	0.0061	J	0.041	0.0041	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	7.7		7.4	2.5	mg/Kg	3	☼	8270D	Total/NA
Formaldehyde	0.083	J	0.093	0.031	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-SB-21 (4.5-5.5) — Lab Sample ID: 410-21255-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	0.022		0.015	0.0046	mg/Kg	1	☼	8260C	Total/NA
Toluene	0.00053	J	0.0038	0.00046	mg/Kg	1	☼	8260C	Total/NA
Benzo[b]fluoranthene	0.0044	J	0.019	0.0038	mg/Kg	1	☼	8270D	Total/NA
Fluoranthene	0.0046	J	0.019	0.0038	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.0074	J	0.019	0.0038	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine	4.4		2.3	0.76	mg/Kg	1	☼	8270D	Total/NA
Formaldehyde	0.18		0.087	0.029	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-SB-17 (8-9) — Lab Sample ID: 410-21255-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	0.010	J	0.020	0.0081	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.0054	J	0.020	0.0040	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	8.6		7.2	2.4	mg/Kg	3	☼	8270D	Total/NA
Formaldehyde	0.22	H	0.091	0.030	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-SB-06 (12-13) — Lab Sample ID: 410-21255-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	0.00079	J	0.0042	0.00042	mg/Kg	1	☼	8260C	Total/NA
Acetone	0.049		0.017	0.0050	mg/Kg	1	☼	8260C	Total/NA
Cyclohexanone	0.026	J	0.21	0.021	mg/Kg	1	☼	8260C	Total/NA
Dicyclohexylamine - DL	13		12	3.9	mg/Kg	5	☼	8270D	Total/NA
Formaldehyde	0.12	H	0.089	0.030	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: TB20083 — Lab Sample ID: 410-21255-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.31	J	1.0	0.20	ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-21
Date Collected: 11/17/20 13:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-1
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			11/28/20 14:33	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			11/28/20 14:33	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			11/28/20 14:33	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			11/28/20 14:33	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			11/28/20 14:33	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			11/28/20 14:33	1
1,2,4-Trimethylbenzene	ND		5.0	1.0	ug/L			11/28/20 14:33	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			11/28/20 14:33	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			11/28/20 14:33	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			11/28/20 14:33	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			11/28/20 14:33	1
1,3,5-Trimethylbenzene	ND		5.0	0.30	ug/L			11/28/20 14:33	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
1,4-Dioxane	ND	F2	250	29	ug/L			11/28/20 14:33	1
2-Butanone	ND		10	0.30	ug/L			11/28/20 14:33	1
2-Hexanone	ND		10	0.30	ug/L			11/28/20 14:33	1
2-Nitropropane	ND		10	0.80	ug/L			11/28/20 14:33	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			11/28/20 14:33	1
Acetone	**1.3**	**J**	20	0.70	ug/L			11/28/20 14:33	1
Acetonitrile	ND		100	16	ug/L			11/28/20 14:33	1
Benzene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Bromochloromethane	ND		5.0	0.20	ug/L			11/28/20 14:33	1
Bromodichloromethane	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Bromoform	ND		4.0	1.0	ug/L			11/28/20 14:33	1
Bromomethane	ND	F1 *	1.0	0.30	ug/L			11/28/20 14:33	1
Carbon disulfide	ND		5.0	0.20	ug/L			11/28/20 14:33	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Chlorobenzene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			11/28/20 14:33	1
Chloroethane	ND	F1 *	1.0	0.20	ug/L			11/28/20 14:33	1
Chloroform	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Chloromethane	ND	F1 *	1.0	0.20	ug/L			11/28/20 14:33	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Cyclohexane	ND	F2	5.0	1.0	ug/L			11/28/20 14:33	1
Cyclohexanone	ND		100	25	ug/L			11/28/20 14:33	1
Dibromochloromethane	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Dichlorodifluoromethane	ND	*	1.0	0.20	ug/L			11/28/20 14:33	1
Ethyl acetate	ND		5.0	0.70	ug/L			11/28/20 14:33	1
Ethyl ether	ND		5.0	0.20	ug/L			11/28/20 14:33	1
Ethylbenzene	ND		1.0	0.40	ug/L			11/28/20 14:33	1
Freon 113	ND	F2	10	0.20	ug/L			11/28/20 14:33	1
Isobutyl alcohol	ND		250	36	ug/L			11/28/20 14:33	1
Isopropylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
m&p-Xylene	ND		5.0	1.0	ug/L			11/28/20 14:33	1
Methyl acetate	ND		5.0	0.30	ug/L			11/28/20 14:33	1

Client Sample ID: B55-PDI-SB-21

Date Collected: 11/17/20 13:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-1

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Methylcyclohexane	ND		5.0	0.50	ug/L			11/28/20 14:33	1
Methylene Chloride	ND		1.0	0.30	ug/L			11/28/20 14:33	1
Naphthalene	ND		5.0	1.0	ug/L			11/28/20 14:33	1
n-Butanol	ND		250	61	ug/L			11/28/20 14:33	1
n-Butylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
n-Heptane	ND	F2	5.0	2.0	ug/L			11/28/20 14:33	1
o-Xylene	ND		1.0	0.40	ug/L			11/28/20 14:33	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
Styrene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
t-Butyl alcohol	ND		50	12	ug/L			11/28/20 14:33	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			11/28/20 14:33	1
Tetrachloroethene	ND	F1	1.0	0.20	ug/L			11/28/20 14:33	1
Tetrahydrofuran	ND		10	0.70	ug/L			11/28/20 14:33	1
Toluene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Trichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Trichlorofluoromethane	ND	F1	1.0	0.20	ug/L			11/28/20 14:33	1
Vinyl chloride	ND	F1 *	1.0	0.20	ug/L			11/28/20 14:33	1
Xylenes, Total	ND		6.0	1.4	ug/L			11/28/20 14:33	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*11/28/20 14:33*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*11/28/20 14:33*	*1*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*		*11/28/20 14:33*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*11/28/20 14:33*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*11/28/20 14:33*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
1,2,4,5-Tetrachlorobenzene	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,2'-oxybis[1-chloropropane]	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,3,4,6-Tetrachlorophenol	ND		10	4.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4,5-Trichlorophenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4,6-Trichlorophenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4-Dichlorophenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4-Dimethylphenol	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4-Dinitrophenol	ND		30	14	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4-Dinitrotoluene	ND		5.1	1.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,6-Dinitrotoluene	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2-Chloronaphthalene	ND		1.0	0.40	ug/L		11/23/20 17:15	12/02/20 16:42	1
2-Chlorophenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2-Methylnaphthalene	ND		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
2-Methylphenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2-Nitroaniline	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1

Client Sample ID: B55-PDI-SB-21
Date Collected: 11/17/20 13:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-1
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
3,3'-Dichlorobenzidine	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
3-Nitroaniline	ND		7.1	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
4,6-Dinitro-2-methylphenol	ND		21	8.1	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Bromophenyl-phenylether	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Chloro-3-methylphenol	ND		3.5	1.6	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Chloroaniline	ND		10	4.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Chlorophenyl-phenyl ether	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
3,4-Methylphenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Nitroaniline	ND		3.0	0.91	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Nitrophenol	ND		30	10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Acenaphthene	**0.17**	**J**	0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Acenaphthylene	**0.42**	**J**	0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Acetophenone	ND		10	4.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Aniline	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Anthracene	**0.16**	**J**	0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Atrazine	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzaldehyde	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzo[a]anthracene	**0.98**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzo[a]pyrene	**1.5**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzo[b]fluoranthene	**1.2**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzo[g,h,i]perylene	**0.91**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzo[k]fluoranthene	**0.53**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzyl alcohol	ND		30	10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Butylbenzylphthalate	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Caprolactam	ND		11	5.1	ug/L		11/23/20 17:15	12/02/20 16:42	1
Carbazole	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Chrysene	**1.3**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Di-n-butyl phthalate	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Di-n-octyl phthalate	ND		11	5.1	ug/L		11/23/20 17:15	12/02/20 16:42	1
Dibenz(a,h)anthracene	ND		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Dibenzofuran	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Dicyclohexylamine	**38**	***-**	20	10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Diethyl phthalate	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Dimethyl phthalate	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Fluoranthene	**1.5**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Fluorene	**0.18**	**J**	0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Hexachlorobenzene	ND		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Hexachlorobutadiene	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Hexachlorocyclopentadiene	ND		11	5.1	ug/L		11/23/20 17:15	12/02/20 16:42	1
Hexachloroethane	ND		5.1	1.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Indeno[1,2,3-cd]pyrene	**0.73**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Isophorone	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
n,n'-Dimethylaniline	ND		1.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
N-Nitrosodi-n-propylamine	ND		3.0	0.71	ug/L		11/23/20 17:15	12/02/20 16:42	1
N-Nitrosodiphenylamine	ND		3.0	0.71	ug/L		11/23/20 17:15	12/02/20 16:42	1
Naphthalene	ND		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Nitrobenzene	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Pentachlorophenol	ND		5.1	1.0	ug/L		11/23/20 17:15	12/02/20 16:42	1

Client Sample ID: B55-PDI-SB-21

Date Collected: 11/17/20 13:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-1
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenanthrene	**0.59**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Phenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Pyrene	**2.5**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Pyridine	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Triethylamine	ND	*-	10	10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Bis(2-chloroethoxy)methane	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Bis(2-chloroethyl)ether	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Bis(2-ethylhexyl) phthalate	ND		11	5.1	ug/L		11/23/20 17:15	12/02/20 16:42	1
1,4-Dioxane	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*7.6*	*T J*	*ug/L*		*10.90*		*11/23/20 17:15*	*12/02/20 16:42*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*72*		*10 - 150*	*11/23/20 17:15*	*12/02/20 16:42*	*1*
2-Fluorobiphenyl (Surr)	*69*		*44 - 102*	*11/23/20 17:15*	*12/02/20 16:42*	*1*
2-Fluorophenol (Surr)	*33*		*10 - 84*	*11/23/20 17:15*	*12/02/20 16:42*	*1*
Nitrobenzene-d5 (Surr)	*69*		*23 - 128*	*11/23/20 17:15*	*12/02/20 16:42*	*1*
p-Terphenyl-d14 (Surr)	*62*		*31 - 113*	*11/23/20 17:15*	*12/02/20 16:42*	*1*
Phenol-d5 (Surr)	*26*		*10 - 67*	*11/23/20 17:15*	*12/02/20 16:42*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 19:30	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 19:30	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 19:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*106*		*39 - 153*	*11/20/20 16:15*	*11/23/20 19:30*	*1*

Client Sample ID: B55-PDI-SB-17 (9-10)

Date Collected: 11/17/20 13:10
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-2
Matrix: Soil
Percent Solids: 84.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,1,2,2-Tetrachloroethane	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,1,2-Trichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,1-Dichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,1-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2,3-Trichlorobenzene	ND		0.0080	0.0040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2,4-Trichlorobenzene	ND		0.0080	0.0040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2,4-Trimethylbenzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2-Dibromo-3-Chloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2-Dibromoethane	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2-Dichloroethane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2-Dichloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,3,5-Trimethylbenzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,3-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1

Client Sample ID: B55-PDI-SB-17 (9-10)
Date Collected: 11/17/20 13:10
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-2
Matrix: Soil
Percent Solids: 84.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,4-Dioxane	ND		0.20	0.030	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
2-Butanone	**0.0025**	**J**	0.0080	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
2-Hexanone	ND		0.0080	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
2-Nitropropane	ND		0.0080	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
4-Methyl-2-pentanone	ND		0.0080	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Acetone	**0.039**		0.016	0.0048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Acetonitrile	ND		0.080	0.020	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Benzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Bromochloromethane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Bromodichloromethane	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Bromoform	ND		0.0080	0.0040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Bromomethane	ND		0.0040	0.00056	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Carbon disulfide	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Carbon tetrachloride	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Chlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Chlorodifluoromethane	ND		0.0080	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Chloroethane	ND		0.0040	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Chloroform	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Chloromethane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
cis-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
cis-1,3-Dichloropropene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Cyclohexane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Cyclohexanone	**0.10**	**J**	0.20	0.020	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Dibromochloromethane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Dichlorodifluoromethane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Ethyl acetate	ND		0.0040	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Ethyl ether	ND		0.0040	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Ethylbenzene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Freon 113	ND		0.0080	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Isobutyl alcohol	ND		0.20	0.030	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Isopropylbenzene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
m&p-Xylene	ND		0.0040	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Methyl acetate	ND		0.0040	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Methyl tertiary butyl ether	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Methylcyclohexane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Methylene Chloride	ND		0.0040	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Naphthalene	ND		0.0040	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
n-Butanol	ND		0.20	0.045	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
n-Butylbenzene	ND		0.0064	0.0024	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
n-Heptane	ND		0.0064	0.0024	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
o-Xylene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
p-Isopropyltoluene	ND		0.0040	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
sec-Butylbenzene	ND		0.0040	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Styrene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
t-Butyl alcohol	**0.033**	**J**	0.080	0.012	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
tert-Butylbenzene	ND		0.0040	0.00064	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Tetrachloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Tetrahydrofuran	ND		0.0064	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1

Client Sample ID: B55-PDI-SB-17 (9-10) — **Lab Sample ID: 410-21255-2**

Date Collected: 11/17/20 13:10 — **Matrix: Soil**

Date Received: 11/18/20 11:46 — **Percent Solids: 84.8**

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
trans-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
trans-1,3-Dichloropropene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Trichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Trichlorofluoromethane	ND		0.0040	0.00056	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Vinyl chloride	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Xylenes, Total	ND		0.0080	0.0011	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.013*	*T J*	*mg/Kg*	☼	*5.21*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Cyclopentane, 1,2,4-trimethyl-	*0.013*	*T J N*	*mg/Kg*	☼	*6.26*	*2815-58-9*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
Unknown	*0.013*	*T J*	*mg/Kg*	☼	*7.86*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Cyclohexane, 1,2,4-trimethyl-	*0.012*	*T J N*	*mg/Kg*	☼	*8.24*	*2234-75-5*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
Unknown	*0.014*	*T J*	*mg/Kg*	☼	*8.95*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Nonane, 3-methyl-	*0.014*	*T J N*	*mg/Kg*	☼	*9.11*	*5911-04-6*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
Unknown	*0.016*	*T J*	*mg/Kg*	☼	*9.17*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Unknown	*0.012*	*T J*	*mg/Kg*	☼	*9.23*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Unknown	*0.012*	*T J*	*mg/Kg*	☼	*9.92*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Benzene, 2,4-diethyl-1-methyl-	*0.014*	*T J N*	*mg/Kg*	☼	*11.62*	*1758-85-6*	*11/18/20 22:22*	*11/24/20 15:56*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*54 - 135*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
4-Bromofluorobenzene (Surr)	*100*		*50 - 131*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
Toluene-d8 (Surr)	*102*		*52 - 141*	*11/18/20 22:22*	*11/24/20 15:56*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
1,2,4,5-Tetrachlorobenzene	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,2'-oxybis[1-chloropropane]	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4,5-Trichlorophenol	ND		0.078	0.035	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4,6-Trichlorophenol	ND		0.067	0.031	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4-Dichlorophenol	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4-Dimethylphenol	ND		0.078	0.035	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4-Dinitrophenol	ND		1.2	0.39	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4-Dinitrotoluene	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,6-Dinitrotoluene	ND		0.059	0.027	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Chloronaphthalene	ND		0.039	0.0078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Chlorophenol	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Methylnaphthalene	ND		0.039	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Methylphenol	ND		0.078	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Nitroaniline	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Nitrophenol	ND		0.067	0.031	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
3,3'-Dichlorobenzidine	ND		0.39	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
3-Nitroaniline	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4,6-Dinitro-2-methylphenol	ND		0.59	0.27	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Bromophenyl-phenylether	ND		0.059	0.027	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Chloro-3-methylphenol	ND		0.059	0.027	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1

Client Sample ID: B55-PDI-SB-17 (9-10)
Date Collected: 11/17/20 13:10
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-2
Matrix: Soil
Percent Solids: 84.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3,4-Methylphenol	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Nitroaniline	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Nitrophenol	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Acenaphthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Acenaphthylene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Acetophenone	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Anthracene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Atrazine	ND		0.51	0.24	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzaldehyde	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzo[a]anthracene	ND		0.020	0.0078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzo[a]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzo[b]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzo[g,h,i]perylene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzo[k]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Bis(2-chloroethoxy)methane	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Bis(2-chloroethyl)ether	ND		0.059	0.027	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Butylbenzylphthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Caprolactam	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Carbazole	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Chrysene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Di-n-butyl phthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Di-n-octyl phthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Dibenz(a,h)anthracene	ND		0.020	0.0078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Dibenzofuran	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Diethyl phthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Dimethyl phthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Chloroaniline	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Fluorene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Chlorophenyl-phenyl ether	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Hexachlorobenzene	ND		0.020	0.0078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Hexachlorobutadiene	ND		0.090	0.043	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Hexachlorocyclopentadiene	ND		0.59	0.24	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Hexachloroethane	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Isophorone	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
N-Nitrosodi-n-propylamine	ND		0.059	0.027	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
N-Nitrosodiphenylamine	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Naphthalene	ND		0.020	0.0078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Nitrobenzene	ND		0.078	0.031	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Phenanthrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Aniline	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Phenol	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Pentachlorophenol	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzyl alcohol	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Dicyclohexylamine	**4.1**		2.4	0.78	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
n,n'-Dimethylaniline	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1

Client Sample ID: B55-PDI-SB-17 (9-10)

Lab Sample ID: 410-21255-2

Date Collected: 11/17/20 13:10 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pyridine	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Triethylamine	ND	*- *1	5.9	2.0	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
1,4-Dioxane	ND		0.39	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.24*	*T J*	*mg/Kg*	☼	*1.76*		*11/24/20 16:27*	*11/25/20 22:01*	*1*
Unknown	*0.98*	*T J*	*mg/Kg*	☼	*3.24*		*11/24/20 16:27*	*11/25/20 22:01*	*1*
Unknown	*12*	*T J B*	*mg/Kg*	☼	*3.90*		*11/24/20 16:27*	*11/25/20 22:01*	*1*
1,2,4-Trithiolane	*0.21*	*T J N*	*mg/Kg*	☼	*6.19*	*289-16-7*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
1,2,4,5-Tetrathiane	*0.21*	*T J N*	*mg/Kg*	☼	*7.85*	*291-22-5*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
Unknown	*0.18*	*T J*	*mg/Kg*	☼	*7.99*		*11/24/20 16:27*	*11/25/20 22:01*	*1*
Unknown	*0.54*	*T J*	*mg/Kg*	☼	*8.40*		*11/24/20 16:27*	*11/25/20 22:01*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.28*	*T J N*	*mg/Kg*	☼	*8.60*	*7560-83-0*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
Lenthionine	*0.41*	*T J N*	*mg/Kg*	☼	*9.33*	*292-46-6*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
Unknown	*0.46*	*T J*	*mg/Kg*	☼	*9.75*		*11/24/20 16:27*	*11/25/20 22:01*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*100*		*45 - 108*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
Nitrobenzene-d5 (Surr)	*68*		*32 - 97*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
2-Fluorophenol (Surr)	*83*		*26 - 96*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
2-Fluorobiphenyl (Surr)	*84*		*39 - 100*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
2,4,6-Tribromophenol (Surr)	*88*		*13 - 121*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
Phenol-d5 (Surr)	*88*		*27 - 104*	*11/24/20 16:27*	*11/25/20 22:01*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	* F1	0.059	0.029	mg/Kg	☼	11/20/20 13:08	11/23/20 22:56	1
Formaldehyde	**0.12**		0.088	0.029	mg/Kg	☼	11/20/20 13:08	11/23/20 22:56	1
Glutaraldehyde	ND		0.059	0.029	mg/Kg	☼	11/20/20 13:08	11/23/20 22:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*108*		*77 - 133*	*11/20/20 13:08*	*11/23/20 22:56*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**15.2**		1.0	1.0	%			11/18/20 22:01	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)

Lab Sample ID: 410-21255-3

Date Collected: 11/17/20 13:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 81.0

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,1,2,2-Tetrachloroethane	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,1,2-Trichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,1-Dichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,1-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2,3-Trichlorobenzene	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2,4-Trichlorobenzene	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Date Collected: 11/17/20 13:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-3
Matrix: Soil
Percent Solids: 81.0

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2-Dibromo-3-Chloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2-Dibromoethane	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2-Dichlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2-Dichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2-Dichloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,3,5-Trimethylbenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,3-Dichlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,4-Dichlorobenzene	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,4-Dioxane	ND		0.23	0.034	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
2-Butanone	**0.0023**	**J**	0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
2-Hexanone	ND		0.0091	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
2-Nitropropane	ND		0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
4-Methyl-2-pentanone	ND		0.0091	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Acetone	**0.035**		0.018	0.0055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Acetonitrile	ND		0.091	0.023	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Benzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Bromochloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Bromodichloromethane	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Bromoform	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Bromomethane	ND		0.0046	0.00064	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Carbon disulfide	**0.0017**	**J**	0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Carbon tetrachloride	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Chlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Chlorodifluoromethane	ND		0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Chloroethane	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Chloroform	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Chloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
cis-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
cis-1,3-Dichloropropene	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Cyclohexane	**0.0067**		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Cyclohexanone	ND		0.23	0.023	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Dibromochloromethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Dichlorodifluoromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Ethyl acetate	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Ethyl ether	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Ethylbenzene	**0.00079**	**J**	0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Freon 113	ND		0.0091	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Isobutyl alcohol	ND		0.23	0.035	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Isopropylbenzene	**0.00066**	**J**	0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
m&p-Xylene	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Methyl acetate	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Methyl tertiary butyl ether	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Methylcyclohexane	**0.0021**	**J**	0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Methylene Chloride	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Naphthalene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
n-Butanol	ND		0.23	0.051	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
n-Butylbenzene	ND		0.0073	0.0027	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
n-Heptane	ND		0.0073	0.0027	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Date Collected: 11/17/20 13:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-3
Matrix: Soil
Percent Solids: 81.0

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
p-Isopropyltoluene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
sec-Butylbenzene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Styrene	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
t-Butyl alcohol	**0.015**	**J**	0.091	0.014	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
tert-Butylbenzene	ND		0.0046	0.00073	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Tetrachloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Tetrahydrofuran	ND		0.0073	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Toluene	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
trans-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
trans-1,3-Dichloropropene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Trichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Trichlorofluoromethane	ND		0.0046	0.00064	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Vinyl chloride	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Xylenes, Total	ND		0.0091	0.0013	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.0063*	*T J*	*mg/Kg*	☼	*10.47*		*11/18/20 22:22*	*11/24/20 16:19*	*1*
Benzene, 1,2,4,5-tetramethyl-	*0.0062*	*T J N*	*mg/Kg*	☼	*11.06*	*95-93-2*	*11/18/20 22:22*	*11/24/20 16:19*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*54 - 135*	*11/18/20 22:22*	*11/24/20 16:19*	*1*
4-Bromofluorobenzene (Surr)	*98*		*50 - 131*	*11/18/20 22:22*	*11/24/20 16:19*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/18/20 22:22*	*11/24/20 16:19*	*1*
Toluene-d8 (Surr)	*103*		*52 - 141*	*11/18/20 22:22*	*11/24/20 16:19*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
1,2,4,5-Tetrachlorobenzene	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,2'-oxybis[1-chloropropane]	ND		0.053	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4,5-Trichlorophenol	ND		0.081	0.037	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4,6-Trichlorophenol	ND		0.069	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4-Dichlorophenol	ND		0.053	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4-Dimethylphenol	ND		0.081	0.037	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4-Dinitrophenol	ND	F1	1.2	0.41	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4-Dinitrotoluene	ND	F2 F1	0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,6-Dinitrotoluene	ND	F2 F1	0.061	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Chloronaphthalene	ND		0.041	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Chlorophenol	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Methylnaphthalene	ND		0.041	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Methylphenol	ND		0.081	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Nitroaniline	ND	F1	0.061	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Nitrophenol	ND	F1	0.069	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
3,3'-Dichlorobenzidine	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
3-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4,6-Dinitro-2-methylphenol	ND	F2 F1	0.61	0.28	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Bromophenyl-phenylether	ND		0.061	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Chloro-3-methylphenol	ND		0.061	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Date Collected: 11/17/20 13:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-3
Matrix: Soil
Percent Solids: 81.0

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3,4-Methylphenol	ND		0.061	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Nitrophenol	ND		0.61	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Acenaphthene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Acenaphthylene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Acetophenone	ND		0.061	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Anthracene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Atrazine	ND		0.53	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzaldehyde	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzo[a]anthracene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzo[a]pyrene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzo[b]fluoranthene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzo[g,h,i]perylene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzo[k]fluoranthene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Bis(2-chloroethoxy)methane	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Bis(2-chloroethyl)ether	ND		0.061	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Butylbenzylphthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Caprolactam	ND		0.20	0.041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Carbazole	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Chrysene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Di-n-butyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Di-n-octyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Dibenz(a,h)anthracene	ND	F1	0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Dibenzofuran	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Diethyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Dimethyl phthalate	ND	F2 F1	0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Fluoranthene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Chloroaniline	ND		0.20	0.041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Fluorene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Chlorophenyl-phenyl ether	ND		0.053	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Hexachlorobenzene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Hexachlorobutadiene	ND		0.093	0.045	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Hexachlorocyclopentadiene	ND	F1	0.61	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Hexachloroethane	ND	F2 F1	0.20	0.041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Isophorone	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
N-Nitrosodi-n-propylamine	ND		0.061	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
N-Nitrosodiphenylamine	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Naphthalene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Nitrobenzene	ND		0.081	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Phenanthrene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Aniline	ND		0.61	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Phenol	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Pyrene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Pentachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzyl alcohol	ND		0.61	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
n,n'-Dimethylaniline	ND		0.20	0.041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Pyridine	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Date Collected: 11/17/20 13:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-3
Matrix: Soil
Percent Solids: 81.0

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Triethylamine	ND	*- *1	6.1	2.0	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
1,4-Dioxane	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*5.8*	*T J*	*mg/Kg*	☼	*3.23*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*10*	*T J B*	*mg/Kg*	☼	*3.87*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*0.21*	*T J*	*mg/Kg*	☼	*5.43*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
1,2,4-Trithiolane	*1.2*	*T J N*	*mg/Kg*	☼	*6.17*	*289-16-7*	*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*0.26*	*T J*	*mg/Kg*	☼	*6.28*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*0.19*	*T J*	*mg/Kg*	☼	*7.07*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*0.17*	*T J*	*mg/Kg*	☼	*7.83*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*1.1*	*T J*	*mg/Kg*	☼	*8.24*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*0.75*	*T J*	*mg/Kg*	☼	*8.27*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*2.2*	*T J*	*mg/Kg*	☼	*8.28*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*1.4*	*T J*	*mg/Kg*	☼	*8.37*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.47*	*T J N*	*mg/Kg*	☼	*8.58*	*7560-83-0*	*11/24/20 16:27*	*11/26/20 13:42*	*1*
Lenthionine	*0.71*	*T J N*	*mg/Kg*	☼	*9.31*	*292-46-6*	*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*0.44*	*T J*	*mg/Kg*	☼	*9.73*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*0.44*	*T J*	*mg/Kg*	☼	*10.05*		*11/24/20 16:27*	*11/26/20 13:42*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*101*		*45 - 108*	*11/24/20 16:27*	*11/26/20 13:42*	*1*
Nitrobenzene-d5 (Surr)	*62*		*32 - 97*	*11/24/20 16:27*	*11/26/20 13:42*	*1*
2-Fluorophenol (Surr)	*82*		*26 - 96*	*11/24/20 16:27*	*11/26/20 13:42*	*1*
2-Fluorobiphenyl (Surr)	*82*		*39 - 100*	*11/24/20 16:27*	*11/26/20 13:42*	*1*
2,4,6-Tribromophenol (Surr)	*72*		*13 - 121*	*11/24/20 16:27*	*11/26/20 13:42*	*1*
Phenol-d5 (Surr)	*87*		*27 - 104*	*11/24/20 16:27*	*11/26/20 13:42*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**9.2**		4.9	1.6	mg/Kg	☼	11/24/20 16:27	12/03/20 11:21	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*93*		*45 - 108*	*11/24/20 16:27*	*12/03/20 11:21*	*2*
Nitrobenzene-d5 (Surr)	*60*		*32 - 97*	*11/24/20 16:27*	*12/03/20 11:21*	*2*
2-Fluorophenol (Surr)	*75*		*26 - 96*	*11/24/20 16:27*	*12/03/20 11:21*	*2*
2-Fluorobiphenyl (Surr)	*76*		*39 - 100*	*11/24/20 16:27*	*12/03/20 11:21*	*2*
2,4,6-Tribromophenol (Surr)	*67*		*13 - 121*	*11/24/20 16:27*	*12/03/20 11:21*	*2*
Phenol-d5 (Surr)	*78*		*27 - 104*	*11/24/20 16:27*	*12/03/20 11:21*	*2*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	*	0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:07	1
Formaldehyde	**0.092**	**J**	0.093	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:07	1
Glutaraldehyde	ND		0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*108*		*77 - 133*	*11/20/20 13:08*	*11/23/20 23:07*	*1*

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)

Lab Sample ID: 410-21255-3

Date Collected: 11/17/20 13:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 81.0

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	19.0		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)

Lab Sample ID: 410-21255-4

Date Collected: 11/17/20 13:45 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 80.7

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,1,2,2-Tetrachloroethane	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,1,2-Trichloroethane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,1-Dichloroethane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,1-Dichloroethene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2,3-Trichlorobenzene	ND		0.0097	0.0048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2,4-Trichlorobenzene	ND		0.0097	0.0048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2,4-Trimethylbenzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2-Dibromo-3-Chloropropane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2-Dibromoethane	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2-Dichlorobenzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2-Dichloroethane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2-Dichloropropane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,3,5-Trimethylbenzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,3-Dichlorobenzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,4-Dichlorobenzene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,4-Dioxane	ND		0.24	0.036	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
2-Butanone	ND		0.0097	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
2-Hexanone	ND		0.0097	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
2-Nitropropane	ND		0.0097	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
4-Methyl-2-pentanone	ND		0.0097	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Acetone	0.023		0.019	0.0058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Acetonitrile	ND		0.097	0.024	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Benzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Bromochloromethane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Bromodichloromethane	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Bromoform	ND		0.0097	0.0048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Bromomethane	ND		0.0048	0.00068	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Carbon disulfide	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Carbon tetrachloride	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Chlorobenzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Chlorodifluoromethane	ND		0.0097	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Chloroethane	ND		0.0048	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Chloroform	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Chloromethane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
cis-1,2-Dichloroethene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
cis-1,3-Dichloropropene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Cyclohexane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Cyclohexanone	ND		0.24	0.024	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Dibromochloromethane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Dichlorodifluoromethane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Ethyl acetate	ND		0.0048	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)
Date Collected: 11/17/20 13:45
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-4
Matrix: Soil
Percent Solids: 80.7

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethyl ether	ND		0.0048	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Ethylbenzene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Freon 113	ND		0.0097	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Isobutyl alcohol	ND		0.24	0.037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Isopropylbenzene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
m&p-Xylene	ND		0.0048	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Methyl acetate	ND		0.0048	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Methyl tertiary butyl ether	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Methylcyclohexane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Methylene Chloride	ND		0.0048	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Naphthalene	ND		0.0048	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
n-Butanol	ND		0.24	0.054	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
n-Butylbenzene	ND		0.0077	0.0029	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
n-Heptane	ND		0.0077	0.0029	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
o-Xylene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
p-Isopropyltoluene	ND		0.0048	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
sec-Butylbenzene	ND		0.0048	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Styrene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
t-Butyl alcohol	ND		0.097	0.015	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
tert-Butylbenzene	ND		0.0048	0.00077	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Tetrachloroethene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Tetrahydrofuran	ND		0.0077	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Toluene	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
trans-1,2-Dichloroethene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
trans-1,3-Dichloropropene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Trichloroethene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Trichlorofluoromethane	ND		0.0048	0.00068	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Vinyl chloride	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Xylenes, Total	ND		0.0097	0.0014	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*	☼			*11/18/20 22:22*	*11/24/20 16:41*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*54 - 135*	*11/18/20 22:22*	*11/24/20 16:41*	*1*
4-Bromofluorobenzene (Surr)	*96*		*50 - 131*	*11/18/20 22:22*	*11/24/20 16:41*	*1*
Dibromofluoromethane (Surr)	*97*		*50 - 141*	*11/18/20 22:22*	*11/24/20 16:41*	*1*
Toluene-d8 (Surr)	*102*		*52 - 141*	*11/18/20 22:22*	*11/24/20 16:41*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
1,2,4,5-Tetrachlorobenzene	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,2'-oxybis[1-chloropropane]	ND		0.053	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4,5-Trichlorophenol	ND		0.082	0.037	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4,6-Trichlorophenol	ND		0.070	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4-Dichlorophenol	ND		0.053	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4-Dimethylphenol	ND		0.082	0.037	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4-Dinitrophenol	ND		1.2	0.41	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)
Date Collected: 11/17/20 13:45
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-4
Matrix: Soil
Percent Solids: 80.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dinitrotoluene	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,6-Dinitrotoluene	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Chloronaphthalene	ND		0.041	0.0082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Chlorophenol	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Methylnaphthalene	ND		0.041	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Methylphenol	ND		0.082	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Nitroaniline	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Nitrophenol	ND		0.070	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
3,3'-Dichlorobenzidine	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
3-Nitroaniline	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4,6-Dinitro-2-methylphenol	ND		0.62	0.29	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Bromophenyl-phenylether	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Chloro-3-methylphenol	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
3,4-Methylphenol	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Nitroaniline	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Nitrophenol	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Acenaphthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Acenaphthylene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Acetophenone	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Anthracene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Atrazine	ND		0.53	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzaldehyde	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzo[a]anthracene	ND		0.021	0.0082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzo[a]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzo[b]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzo[g,h,i]perylene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzo[k]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Bis(2-chloroethoxy)methane	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Bis(2-chloroethyl)ether	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Bis(2-ethylhexyl) phthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Butylbenzylphthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Caprolactam	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Carbazole	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Chrysene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Di-n-butyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Di-n-octyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Dibenz(a,h)anthracene	ND		0.021	0.0082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Dibenzofuran	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Diethyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Dimethyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Chloroaniline	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Fluorene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Chlorophenyl-phenyl ether	ND		0.053	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Hexachlorobenzene	ND		0.021	0.0082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Hexachlorobutadiene	ND		0.094	0.045	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Hexachlorocyclopentadiene	ND		0.62	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Hexachloroethane	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)
Date Collected: 11/17/20 13:45
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-4
Matrix: Soil
Percent Solids: 80.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isophorone	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
N-Nitrosodi-n-propylamine	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
N-Nitrosodiphenylamine	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Naphthalene	ND		0.021	0.0082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Nitrobenzene	ND		0.082	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Phenanthrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Aniline	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Phenol	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Pentachlorophenol	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzyl alcohol	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Dicyclohexylamine	**1.9**	**J**	2.5	0.82	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
n,n'-Dimethylaniline	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Pyridine	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Triethylamine	ND	*- *1	6.2	2.1	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
1,4-Dioxane	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.37*	*T J*	*mg/Kg*	☼	*1.77*		*11/24/20 16:27*	*11/25/20 22:25*	*1*
Unknown	*0.99*	*T J*	*mg/Kg*	☼	*3.24*		*11/24/20 16:27*	*11/25/20 22:25*	*1*
Unknown	*12*	*T J B*	*mg/Kg*	☼	*3.91*		*11/24/20 16:27*	*11/25/20 22:25*	*1*
Unknown	*0.29*	*T J*	*mg/Kg*	☼	*6.30*		*11/24/20 16:27*	*11/25/20 22:25*	*1*
Unknown	*0.32*	*T J*	*mg/Kg*	☼	*7.09*		*11/24/20 16:27*	*11/25/20 22:25*	*1*
Unknown	*0.45*	*T J*	*mg/Kg*	☼	*8.31*		*11/24/20 16:27*	*11/25/20 22:25*	*1*
Unknown	*0.27*	*T J*	*mg/Kg*	☼	*8.39*		*11/24/20 16:27*	*11/25/20 22:25*	*1*
Unknown	*0.19*	*T J*	*mg/Kg*	☼	*9.74*		*11/24/20 16:27*	*11/25/20 22:25*	*1*
Unknown	*0.47*	*T J*	*mg/Kg*	☼	*10.07*		*11/24/20 16:27*	*11/25/20 22:25*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*73*		*45 - 108*	*11/24/20 16:27*	*11/25/20 22:25*	*1*
Nitrobenzene-d5 (Surr)	*71*		*32 - 97*	*11/24/20 16:27*	*11/25/20 22:25*	*1*
2-Fluorophenol (Surr)	*82*		*26 - 96*	*11/24/20 16:27*	*11/25/20 22:25*	*1*
2-Fluorobiphenyl (Surr)	*73*		*39 - 100*	*11/24/20 16:27*	*11/25/20 22:25*	*1*
2,4,6-Tribromophenol (Surr)	*83*		*13 - 121*	*11/24/20 16:27*	*11/25/20 22:25*	*1*
Phenol-d5 (Surr)	*79*		*27 - 104*	*11/24/20 16:27*	*11/25/20 22:25*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	*	0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:19	1
Formaldehyde	**0.069**	**J**	0.093	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:19	1
Glutaraldehyde	ND		0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*106*		*77 - 133*	*11/20/20 13:08*	*11/23/20 23:19*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**19.3**		1.0	1.0	%			11/18/20 23:40	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)
Date Collected: 11/17/20 14:00
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-5
Matrix: Soil
Percent Solids: 77.9

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,1,2,2-Tetrachloroethane	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,1,2-Trichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,1-Dichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,1-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2,3-Trichlorobenzene	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2,4-Trichlorobenzene	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2,4-Trimethylbenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2-Dibromo-3-Chloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2-Dibromoethane	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2-Dichlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2-Dichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2-Dichloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,3,5-Trimethylbenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,3-Dichlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,4-Dichlorobenzene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,4-Dioxane	ND		0.23	0.034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
2-Butanone	**0.0026**	**J**	0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
2-Hexanone	ND		0.0091	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
2-Nitropropane	ND		0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
4-Methyl-2-pentanone	ND		0.0091	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Acetone	**0.071**		0.018	0.0055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Acetonitrile	ND		0.091	0.023	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Benzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Bromochloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Bromodichloromethane	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Bromoform	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Bromomethane	ND		0.0046	0.00064	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Carbon disulfide	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Carbon tetrachloride	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Chlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Chlorodifluoromethane	ND		0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Chloroethane	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Chloroform	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Chloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
cis-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
cis-1,3-Dichloropropene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Cyclohexane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Cyclohexanone	ND		0.23	0.023	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Dibromochloromethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Dichlorodifluoromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Ethyl acetate	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Ethyl ether	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Ethylbenzene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Freon 113	ND		0.0091	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Isobutyl alcohol	ND		0.23	0.035	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Isopropylbenzene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
m&p-Xylene	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Methyl acetate	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)

Date Collected: 11/17/20 14:00
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-5

Matrix: Soil
Percent Solids: 77.9

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Methylcyclohexane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Methylene Chloride	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Naphthalene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
n-Butanol	ND		0.23	0.051	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
n-Butylbenzene	ND		0.0073	0.0027	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
n-Heptane	ND		0.0073	0.0027	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
o-Xylene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
p-Isopropyltoluene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
sec-Butylbenzene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Styrene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
t-Butyl alcohol	**0.073**	**J**	0.091	0.014	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
tert-Butylbenzene	ND		0.0046	0.00073	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Tetrachloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Tetrahydrofuran	ND		0.0073	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Toluene	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
trans-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
trans-1,3-Dichloropropene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Trichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Trichlorofluoromethane	ND		0.0046	0.00064	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Vinyl chloride	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Xylenes, Total	ND		0.0091	0.0013	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*	☼			*11/18/20 22:22*	*11/24/20 17:03*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/18/20 22:22*	*11/24/20 17:03*	*1*
4-Bromofluorobenzene (Surr)	*97*		*50 - 131*	*11/18/20 22:22*	*11/24/20 17:03*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/18/20 22:22*	*11/24/20 17:03*	*1*
Toluene-d8 (Surr)	*102*		*52 - 141*	*11/18/20 22:22*	*11/24/20 17:03*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
1,2,4,5-Tetrachlorobenzene	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,2'-oxybis[1-chloropropane]	ND		0.055	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4,5-Trichlorophenol	ND		0.084	0.038	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4,6-Trichlorophenol	ND		0.072	0.034	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4-Dichlorophenol	ND		0.055	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4-Dimethylphenol	ND		0.084	0.038	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4-Dinitrophenol	ND		1.3	0.42	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4-Dinitrotoluene	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,6-Dinitrotoluene	ND		0.063	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Chloronaphthalene	ND		0.042	0.0084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Chlorophenol	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Methylnaphthalene	ND		0.042	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Methylphenol	ND		0.084	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Nitroaniline	ND		0.063	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)
Date Collected: 11/17/20 14:00
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-5
Matrix: Soil
Percent Solids: 77.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	ND		0.072	0.034	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
3,3'-Dichlorobenzidine	ND		0.42	0.13	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
3-Nitroaniline	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4,6-Dinitro-2-methylphenol	ND		0.63	0.29	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Bromophenyl-phenylether	ND		0.063	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Chloro-3-methylphenol	ND		0.063	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
3,4-Methylphenol	ND		0.063	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Nitroaniline	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Nitrophenol	ND		0.63	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Acenaphthene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Acenaphthylene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Acetophenone	ND		0.063	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Anthracene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Atrazine	ND		0.55	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzaldehyde	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzo[a]anthracene	ND		0.021	0.0084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzo[a]pyrene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzo[b]fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzo[g,h,i]perylene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzo[k]fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Bis(2-chloroethoxy)methane	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Bis(2-chloroethyl)ether	ND		0.063	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Bis(2-ethylhexyl) phthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Butylbenzylphthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Caprolactam	ND		0.21	0.042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Carbazole	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Chrysene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Di-n-butyl phthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Di-n-octyl phthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Dibenz(a,h)anthracene	ND		0.021	0.0084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Dibenzofuran	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Diethyl phthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Dimethyl phthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Chloroaniline	ND		0.21	0.042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Fluorene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Chlorophenyl-phenyl ether	ND		0.055	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Hexachlorobenzene	ND		0.021	0.0084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Hexachlorobutadiene	ND		0.097	0.046	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Hexachlorocyclopentadiene	ND		0.63	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Hexachloroethane	ND		0.21	0.042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Isophorone	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
N-Nitrosodi-n-propylamine	ND		0.063	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
N-Nitrosodiphenylamine	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Naphthalene	ND		0.021	0.0084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Nitrobenzene	ND		0.084	0.034	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Phenanthrene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Aniline	ND		0.63	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)

Date Collected: 11/17/20 14:00
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-5

Matrix: Soil
Percent Solids: 77.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenol	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Pyrene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Pentachlorophenol	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzyl alcohol	ND		0.63	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
n,n'-Dimethylaniline	ND		0.21	0.042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Pyridine	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Triethylamine	ND	*- *1	6.3	2.1	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
1,4-Dioxane	ND		0.42	0.13	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*22*	*T J B*	*mg/Kg*	☼	*3.29*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*23*	*T J*	*mg/Kg*	☼	*3.91*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.24*	*T J*	*mg/Kg*	☼	*4.46*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.27*	*T J*	*mg/Kg*	☼	*5.01*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.19*	*T J*	*mg/Kg*	☼	*5.44*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.54*	*T J*	*mg/Kg*	☼	*5.45*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
1,2,4-Trithiolane	*1.4*	*T J N*	*mg/Kg*	☼	*6.20*	*289-16-7*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.26*	*T J*	*mg/Kg*	☼	*6.30*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.17*	*T J*	*mg/Kg*	☼	*6.99*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.23*	*T J*	*mg/Kg*	☼	*7.09*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.17*	*T J*	*mg/Kg*	☼	*7.85*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*3.4*	*T J*	*mg/Kg*	☼	*8.22*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*1.4*	*T J*	*mg/Kg*	☼	*8.40*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.58*	*T J*	*mg/Kg*	☼	*8.44*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.54*	*T J N*	*mg/Kg*	☼	*8.60*	*7560-83-0*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
Lenthionine	*0.26*	*T J N*	*mg/Kg*	☼	*9.33*	*292-46-6*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.64*	*T J*	*mg/Kg*	☼	*9.75*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.66*	*T J*	*mg/Kg*	☼	*10.07*		*11/24/20 16:27*	*11/25/20 22:49*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*106*		*45 - 108*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
Nitrobenzene-d5 (Surr)	*65*		*32 - 97*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
2-Fluorophenol (Surr)	*83*		*26 - 96*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
2-Fluorobiphenyl (Surr)	*82*		*39 - 100*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
2,4,6-Tribromophenol (Surr)	*69*		*13 - 121*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
Phenol-d5 (Surr)	*87*		*27 - 104*	*11/24/20 16:27*	*11/25/20 22:49*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**12**		7.6	2.5	mg/Kg	☼	11/24/20 16:27	11/30/20 15:54	3

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*82*		*45 - 108*	*11/24/20 16:27*	*11/30/20 15:54*	*3*
Nitrobenzene-d5 (Surr)	*52*		*32 - 97*	*11/24/20 16:27*	*11/30/20 15:54*	*3*
2-Fluorophenol (Surr)	*62*		*26 - 96*	*11/24/20 16:27*	*11/30/20 15:54*	*3*
2-Fluorobiphenyl (Surr)	*64*		*39 - 100*	*11/24/20 16:27*	*11/30/20 15:54*	*3*
2,4,6-Tribromophenol (Surr)	*51*		*13 - 121*	*11/24/20 16:27*	*11/30/20 15:54*	*3*
Phenol-d5 (Surr)	*63*		*27 - 104*	*11/24/20 16:27*	*11/30/20 15:54*	*3*

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)

Lab Sample ID: 410-21255-5

Date Collected: 11/17/20 14:00 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 77.9

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	*	0.064	0.032	mg/Kg	☼	11/20/20 13:08	11/23/20 23:30	1
Formaldehyde	**0.16**		0.096	0.032	mg/Kg	☼	11/20/20 13:08	11/23/20 23:30	1
Glutaraldehyde	ND		0.064	0.032	mg/Kg	☼	11/20/20 13:08	11/23/20 23:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*107*		*77 - 133*	*11/20/20 13:08*	*11/23/20 23:30*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**22.1**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)

Lab Sample ID: 410-21255-6

Date Collected: 11/17/20 14:05 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 80.4

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
trans-1,3-Dichloropropene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Ethylbenzene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Styrene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,4-Dichlorobenzene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2-Dibromoethane	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2-Dichloroethane	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
4-Methyl-2-pentanone	ND		0.62	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Methylcyclohexane	**0.55**		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Toluene	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Chlorobenzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2,4-Trimethylbenzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Cyclohexane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2,4-Trichlorobenzene	ND		0.62	0.31	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,4-Dioxane	ND		15	2.3	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Dibromochloromethane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Tetrachloroethene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
cis-1,2-Dichloroethene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
trans-1,2-Dichloroethene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Methyl tertiary butyl ether	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
m&p-Xylene	ND		0.31	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,3,5-Trimethylbenzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,3-Dichlorobenzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Carbon tetrachloride	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
2-Hexanone	ND		0.62	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Acetone	ND		1.2	0.37	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Chloroform	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Benzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,1,1-Trichloroethane	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Bromomethane	ND		0.31	0.043	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Chloromethane	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Bromochloromethane	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Chloroethane	ND		0.31	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Date Collected: 11/17/20 14:05
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-6
Matrix: Soil
Percent Solids: 80.4

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Methylene Chloride	ND		0.31	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Carbon disulfide	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Bromoform	ND	*	0.62	0.31	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Bromodichloromethane	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,1-Dichloroethane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,1-Dichloroethene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Trichlorofluoromethane	ND		0.31	0.043	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Dichlorodifluoromethane	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Freon 113	ND		0.62	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2-Dichloropropane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
2-Butanone	ND		0.62	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,1,2-Trichloroethane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
2-Nitropropane	ND	*	0.62	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Trichloroethene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Methyl acetate	ND		0.31	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,1,2,2-Tetrachloroethane	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2,3-Trichlorobenzene	ND		0.62	0.31	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
o-Xylene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2-Dichlorobenzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2-Dibromo-3-Chloropropane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Acetonitrile	ND		6.2	1.5	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Isopropylbenzene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Chlorodifluoromethane	ND		0.62	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Cyclohexanone	ND		15	1.5	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Ethyl acetate	ND		0.31	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Ethyl ether	ND		0.31	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Isobutyl alcohol	ND		15	2.3	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Naphthalene	ND		0.31	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
n-Butanol	ND		15	3.5	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
n-Butylbenzene	ND		0.49	0.19	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
n-Heptane	**0.86**		0.49	0.19	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
p-Isopropyltoluene	ND		0.31	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
sec-Butylbenzene	ND		0.31	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
t-Butyl alcohol	ND		6.2	0.93	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
tert-Butylbenzene	ND		0.31	0.049	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Tetrahydrofuran	ND		0.49	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Xylenes, Total	ND		0.62	0.086	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Hexane, 3-methyl-	*0.48*	*T J N*	*mg/Kg*	☼	*7.30*	*589-34-4*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Heptane, 3-methyl-	*0.43*	*T J N*	*mg/Kg*	☼	*9.63*	*589-81-1*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Unknown	*0.42*	*T J*	*mg/Kg*	☼	*10.12*		*11/19/20 20:14*	*11/25/20 01:04*	*50*
Unknown	*0.38*	*T J*	*mg/Kg*	☼	*11.12*		*11/19/20 20:14*	*11/25/20 01:04*	*50*
Benzene, 1-ethyl-2,4-dimethyl-	*0.80*	*T J N*	*mg/Kg*	☼	*13.68*	*874-41-9*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Benzene, 1,2,4,5-tetramethyl-	*0.79*	*T J N*	*mg/Kg*	☼	*13.96*	*95-93-2*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Unknown	*0.41*	*T J*	*mg/Kg*	☼	*14.22*		*11/19/20 20:14*	*11/25/20 01:04*	*50*
Unknown	*0.61*	*T J*	*mg/Kg*	☼	*14.29*		*11/19/20 20:14*	*11/25/20 01:04*	*50*
Benzene, (1-methyl-1-butenyl)-	*0.57*	*T J N*	*mg/Kg*	☼	*14.51*	*53172-84-2*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
1H-Indene, 2,3-dihydro-1,3-dimethyl-	*0.59*	*T J N*	*mg/Kg*	☼	*14.60*	*4175-53-5*	*11/19/20 20:14*	*11/25/20 01:04*	*50*

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Date Collected: 11/17/20 14:05
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-6
Matrix: Soil
Percent Solids: 80.4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*54 - 135*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
4-Bromofluorobenzene (Surr)	*85*		*50 - 131*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Dibromofluoromethane (Surr)	*81*		*50 - 141*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Toluene-d8 (Surr)	*83*		*52 - 141*	*11/19/20 20:14*	*11/25/20 01:04*	*50*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
1,2,4,5-Tetrachlorobenzene	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,2'-oxybis[1-chloropropane]	ND		0.054	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4,5-Trichlorophenol	ND		0.083	0.037	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4,6-Trichlorophenol	ND		0.070	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4-Dichlorophenol	ND		0.054	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4-Dimethylphenol	ND		0.083	0.037	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4-Dinitrophenol	ND		1.2	0.41	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4-Dinitrotoluene	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,6-Dinitrotoluene	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Chloronaphthalene	ND		0.041	0.0083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Chlorophenol	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Methylnaphthalene	**0.0061**	**J**	0.041	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Methylphenol	ND		0.083	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Nitroaniline	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Nitrophenol	ND		0.070	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
3,3'-Dichlorobenzidine	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
3-Nitroaniline	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4,6-Dinitro-2-methylphenol	ND		0.62	0.29	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Bromophenyl-phenylether	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Chloro-3-methylphenol	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
3,4-Methylphenol	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Nitroaniline	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Nitrophenol	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Acenaphthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Acenaphthylene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Acetophenone	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Anthracene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Atrazine	ND		0.54	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzaldehyde	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzo[a]anthracene	ND		0.021	0.0083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzo[a]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzo[b]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzo[g,h,i]perylene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzo[k]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Bis(2-chloroethoxy)methane	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Bis(2-chloroethyl)ether	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Bis(2-ethylhexyl) phthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Butylbenzylphthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Caprolactam	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Carbazole	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Chrysene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Date Collected: 11/17/20 14:05
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-6
Matrix: Soil
Percent Solids: 80.4

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Di-n-butyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Di-n-octyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Dibenz(a,h)anthracene	ND		0.021	0.0083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Dibenzofuran	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Diethyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Dimethyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Chloroaniline	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Fluorene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Chlorophenyl-phenyl ether	ND		0.054	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Hexachlorobenzene	ND		0.021	0.0083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Hexachlorobutadiene	ND		0.095	0.045	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Hexachlorocyclopentadiene	ND		0.62	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Hexachloroethane	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Isophorone	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
N-Nitrosodi-n-propylamine	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
N-Nitrosodiphenylamine	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Naphthalene	ND		0.021	0.0083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Nitrobenzene	ND		0.083	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Phenanthrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Aniline	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Phenol	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Pentachlorophenol	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzyl alcohol	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
n,n'-Dimethylaniline	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Pyridine	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Triethylamine	ND	*- *1	6.2	2.1	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
1,4-Dioxane	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.0*	*T J*	*mg/Kg*	☼	*3.24*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*5.0*	*T J B*	*mg/Kg*	☼	*3.90*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
2-Cyclohexen-1-one	*0.22*	*T J N*	*mg/Kg*	☼	*4.81*	*930-68-7*	*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*0.17*	*T J*	*mg/Kg*	☼	*5.02*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*0.18*	*T J*	*mg/Kg*	☼	*5.87*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
1,2,4-Trithiolane	*0.40*	*T J N*	*mg/Kg*	☼	*6.19*	*289-16-7*	*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*0.25*	*T J*	*mg/Kg*	☼	*7.01*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Cyclohexane, isothiocyanato-	*0.24*	*T J N*	*mg/Kg*	☼	*7.05*	*1122-82-3*	*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*0.49*	*T J*	*mg/Kg*	☼	*7.09*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*0.81*	*T J*	*mg/Kg*	☼	*8.25*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*2.7*	*T J*	*mg/Kg*	☼	*8.31*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*0.43*	*T J*	*mg/Kg*	☼	*8.37*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*1.9*	*T J*	*mg/Kg*	☼	*8.40*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*1.1*	*T J*	*mg/Kg*	☼	*8.52*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.60*	*T J N*	*mg/Kg*	☼	*8.61*	*7560-83-0*	*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*0.38*	*T J*	*mg/Kg*	☼	*8.75*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*0.22*	*T J*	*mg/Kg*	☼	*8.87*		*11/24/20 16:27*	*11/25/20 23:13*	*1*

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)

Date Collected: 11/17/20 14:05
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-6
Matrix: Soil
Percent Solids: 80.4

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	0.76	T J	mg/Kg	☼	8.89		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.22	T J	mg/Kg	☼	9.17		11/24/20 16:27	11/25/20 23:13	1
Lenthionine	0.69	T J N	mg/Kg	☼	9.33	292-46-6	11/24/20 16:27	11/25/20 23:13	1
Unknown	0.31	T J	mg/Kg	☼	9.37		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.25	T J	mg/Kg	☼	9.67		11/24/20 16:27	11/25/20 23:13	1
Unknown	2.0	T J	mg/Kg	☼	9.75		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.30	T J	mg/Kg	☼	10.07		11/24/20 16:27	11/25/20 23:13	1
Cyclic octaatomic sulfur	0.34	T J N	mg/Kg	☼	11.14	10544-50-0	11/24/20 16:27	11/25/20 23:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	106		45 - 108	11/24/20 16:27	11/25/20 23:13	1
Nitrobenzene-d5 (Surr)	74		32 - 97	11/24/20 16:27	11/25/20 23:13	1
2-Fluorophenol (Surr)	87		26 - 96	11/24/20 16:27	11/25/20 23:13	1
2-Fluorobiphenyl (Surr)	84		39 - 100	11/24/20 16:27	11/25/20 23:13	1
2,4,6-Tribromophenol (Surr)	81		13 - 121	11/24/20 16:27	11/25/20 23:13	1
Phenol-d5 (Surr)	89		27 - 104	11/24/20 16:27	11/25/20 23:13	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**7.7**		7.4	2.5	mg/Kg	☼	11/24/20 16:27	12/02/20 16:32	3

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	83		45 - 108	11/24/20 16:27	12/02/20 16:32	3
Nitrobenzene-d5 (Surr)	61		32 - 97	11/24/20 16:27	12/02/20 16:32	3
2-Fluorophenol (Surr)	63		26 - 96	11/24/20 16:27	12/02/20 16:32	3
2-Fluorobiphenyl (Surr)	67		39 - 100	11/24/20 16:27	12/02/20 16:32	3
2,4,6-Tribromophenol (Surr)	57		13 - 121	11/24/20 16:27	12/02/20 16:32	3
Phenol-d5 (Surr)	65		27 - 104	11/24/20 16:27	12/02/20 16:32	3

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	*	0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:42	1
Formaldehyde	**0.083**	**J**	0.093	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:42	1
Glutaraldehyde	ND		0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	116		77 - 133	11/20/20 13:08	11/23/20 23:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**19.6**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)

Date Collected: 11/17/20 14:15
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-7
Matrix: Soil
Percent Solids: 85.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,1,2,2-Tetrachloroethane	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,1,2-Trichloroethane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)
Date Collected: 11/17/20 14:15
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-7
Matrix: Soil
Percent Solids: 85.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,1-Dichloroethene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2,3-Trichlorobenzene	ND		0.0076	0.0038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2,4-Trichlorobenzene	ND		0.0076	0.0038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2,4-Trimethylbenzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2-Dibromo-3-Chloropropane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2-Dibromoethane	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2-Dichlorobenzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2-Dichloroethane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2-Dichloropropane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,3,5-Trimethylbenzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,3-Dichlorobenzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,4-Dichlorobenzene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,4-Dioxane	ND		0.19	0.028	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
2-Butanone	ND		0.0076	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
2-Hexanone	ND		0.0076	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
2-Nitropropane	ND		0.0076	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
4-Methyl-2-pentanone	ND		0.0076	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Acetone	**0.022**		0.015	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Acetonitrile	ND		0.076	0.019	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Benzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Bromochloromethane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Bromodichloromethane	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Bromoform	ND		0.0076	0.0038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Bromomethane	ND		0.0038	0.00054	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Carbon disulfide	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Carbon tetrachloride	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Chlorobenzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Chlorodifluoromethane	ND		0.0076	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Chloroethane	ND		0.0038	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Chloroform	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Chloromethane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
cis-1,2-Dichloroethene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
cis-1,3-Dichloropropene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Cyclohexane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Cyclohexanone	ND		0.19	0.019	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Dibromochloromethane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Dichlorodifluoromethane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Ethyl acetate	ND		0.0038	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Ethyl ether	ND		0.0038	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Ethylbenzene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Freon 113	ND		0.0076	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Isobutyl alcohol	ND		0.19	0.029	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Isopropylbenzene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
m&p-Xylene	ND		0.0038	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Methyl acetate	ND		0.0038	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Methyl tertiary butyl ether	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Methylcyclohexane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Methylene Chloride	ND		0.0038	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)
Date Collected: 11/17/20 14:15
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-7
Matrix: Soil
Percent Solids: 85.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.0038	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
n-Butanol	ND		0.19	0.043	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
n-Butylbenzene	ND		0.0061	0.0023	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
n-Heptane	ND		0.0061	0.0023	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
o-Xylene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
p-Isopropyltoluene	ND		0.0038	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
sec-Butylbenzene	ND		0.0038	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Styrene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
t-Butyl alcohol	ND		0.076	0.011	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
tert-Butylbenzene	ND		0.0038	0.00061	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Tetrachloroethene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Tetrahydrofuran	ND		0.0061	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Toluene	**0.00053**	**J**	0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
trans-1,2-Dichloroethene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
trans-1,3-Dichloropropene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Trichloroethene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Trichlorofluoromethane	ND		0.0038	0.00054	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Vinyl chloride	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Xylenes, Total	ND		0.0076	0.0011	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*	☼			*11/18/20 22:22*	*11/24/20 17:25*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*54 - 135*	*11/18/20 22:22*	*11/24/20 17:25*	*1*
4-Bromofluorobenzene (Surr)	*96*		*50 - 131*	*11/18/20 22:22*	*11/24/20 17:25*	*1*
Dibromofluoromethane (Surr)	*100*		*50 - 141*	*11/18/20 22:22*	*11/24/20 17:25*	*1*
Toluene-d8 (Surr)	*101*		*52 - 141*	*11/18/20 22:22*	*11/24/20 17:25*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
1,2,4,5-Tetrachlorobenzene	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,2'-oxybis[1-chloropropane]	ND		0.050	0.023	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,3,4,6-Tetrachlorophenol	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4,5-Trichlorophenol	ND		0.076	0.034	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4,6-Trichlorophenol	ND		0.065	0.031	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4-Dichlorophenol	ND		0.050	0.023	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4-Dimethylphenol	ND		0.076	0.034	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4-Dinitrophenol	ND		1.1	0.38	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4-Dinitrotoluene	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,6-Dinitrotoluene	ND		0.057	0.027	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Chloronaphthalene	ND		0.038	0.0076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Chlorophenol	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Methylnaphthalene	ND		0.038	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Methylphenol	ND		0.076	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Nitroaniline	ND		0.057	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Nitrophenol	ND		0.065	0.031	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
3,3'-Dichlorobenzidine	ND		0.38	0.11	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
3-Nitroaniline	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)

Date Collected: 11/17/20 14:15
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-7

Matrix: Soil
Percent Solids: 85.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,6-Dinitro-2-methylphenol	ND		0.57	0.27	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Bromophenyl-phenylether	ND		0.057	0.027	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Chloro-3-methylphenol	ND		0.057	0.027	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
3,4-Methylphenol	ND		0.057	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Nitroaniline	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Nitrophenol	ND		0.57	0.19	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Acenaphthene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Acenaphthylene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Acetophenone	ND		0.057	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Anthracene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Atrazine	ND		0.50	0.23	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzaldehyde	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzo[a]anthracene	ND		0.019	0.0076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzo[a]pyrene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzo[b]fluoranthene	**0.0044**	**J**	0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzo[g,h,i]perylene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzo[k]fluoranthene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Bis(2-chloroethoxy)methane	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Bis(2-chloroethyl)ether	ND		0.057	0.027	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Bis(2-ethylhexyl) phthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Butylbenzylphthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Caprolactam	ND		0.19	0.038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Carbazole	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Chrysene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Di-n-butyl phthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Di-n-octyl phthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Dibenz(a,h)anthracene	ND		0.019	0.0076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Dibenzofuran	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Diethyl phthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Dimethyl phthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Fluoranthene	**0.0046**	**J**	0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Chloroaniline	ND		0.19	0.038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Fluorene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Chlorophenyl-phenyl ether	ND		0.050	0.023	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Hexachlorobenzene	ND		0.019	0.0076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Hexachlorobutadiene	ND		0.088	0.042	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Hexachlorocyclopentadiene	ND		0.57	0.23	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Hexachloroethane	ND		0.19	0.038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Indeno[1,2,3-cd]pyrene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Isophorone	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
N-Nitrosodi-n-propylamine	ND		0.057	0.027	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
N-Nitrosodiphenylamine	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Naphthalene	ND		0.019	0.0076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Nitrobenzene	ND		0.076	0.031	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Phenanthrene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Aniline	ND		0.57	0.19	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Phenol	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Pyrene	**0.0074**	**J**	0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Pentachlorophenol	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)

Date Collected: 11/17/20 14:15
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-7

Matrix: Soil
Percent Solids: 85.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzyl alcohol	ND		0.57	0.19	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Dicyclohexylamine	**4.4**		2.3	0.76	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
n,n'-Dimethylaniline	ND		0.19	0.038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Pyridine	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Triethylamine	ND	*- *1	5.7	1.9	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
1,4-Dioxane	ND		0.38	0.11	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*4.5*	*T J*	*mg/Kg*	☼	*3.20*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*5.6*	*T J B*	*mg/Kg*	☼	*3.84*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.38*	*T J*	*mg/Kg*	☼	*4.97*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Cyclotetrasiloxane, octamethyl-	*0.15*	*T J N*	*mg/Kg*	☼	*5.19*	*556-67-2*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.43*	*T J*	*mg/Kg*	☼	*5.39*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
1,2,4-Trithiolane	*0.59*	*T J N*	*mg/Kg*	☼	*6.14*	*289-16-7*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.15*	*T J*	*mg/Kg*	☼	*6.25*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.29*	*T J*	*mg/Kg*	☼	*7.04*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
1,2,4,5-Tetrathiane	*0.57*	*T J N*	*mg/Kg*	☼	*7.80*	*291-22-5*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*1.1*	*T J*	*mg/Kg*	☼	*8.21*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.34*	*T J*	*mg/Kg*	☼	*8.25*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.66*	*T J*	*mg/Kg*	☼	*8.29*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Lenthionine	*1.8*	*T J N*	*mg/Kg*	☼	*9.28*	*292-46-6*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.79*	*T J*	*mg/Kg*	☼	*9.69*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.76*	*T J*	*mg/Kg*	☼	*10.02*		*11/24/20 16:27*	*11/30/20 20:43*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*102*		*45 - 108*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Nitrobenzene-d5 (Surr)	*68*		*32 - 97*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
2-Fluorophenol (Surr)	*84*		*26 - 96*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
2-Fluorobiphenyl (Surr)	*85*		*39 - 100*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
2,4,6-Tribromophenol (Surr)	*65*		*13 - 121*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Phenol-d5 (Surr)	*87*		*27 - 104*	*11/24/20 16:27*	*11/30/20 20:43*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.058	0.029	mg/Kg	☼	11/29/20 10:15	12/03/20 12:34	1
Formaldehyde	**0.18**		0.087	0.029	mg/Kg	☼	11/29/20 10:15	12/03/20 12:34	1
Glutaraldehyde	ND		0.058	0.029	mg/Kg	☼	11/29/20 10:15	12/03/20 12:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*94*		*77 - 133*	*11/29/20 10:15*	*12/03/20 12:34*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**14.2**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-17 (8-9)
Date Collected: 11/17/20 14:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-8
Matrix: Soil
Percent Solids: 82.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
trans-1,3-Dichloropropene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Ethylbenzene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Styrene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,4-Dichlorobenzene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2-Dibromoethane	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2-Dichloroethane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
4-Methyl-2-pentanone	ND		0.58	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Methylcyclohexane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Toluene	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Chlorobenzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2,4-Trimethylbenzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Cyclohexane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2,4-Trichlorobenzene	ND		0.58	0.29	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,4-Dioxane	ND		15	2.2	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Dibromochloromethane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Tetrachloroethene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
cis-1,2-Dichloroethene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
trans-1,2-Dichloroethene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Methyl tertiary butyl ether	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
m&p-Xylene	ND		0.29	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,3,5-Trimethylbenzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,3-Dichlorobenzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Carbon tetrachloride	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
2-Hexanone	ND		0.58	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Acetone	ND		1.2	0.35	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Chloroform	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Benzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,1,1-Trichloroethane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Bromomethane	ND		0.29	0.041	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Chloromethane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Bromochloromethane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Chloroethane	ND		0.29	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Vinyl chloride	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Methylene Chloride	ND		0.29	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Carbon disulfide	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Bromoform	ND	*	0.58	0.29	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Bromodichloromethane	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,1-Dichloroethane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,1-Dichloroethene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Trichlorofluoromethane	ND		0.29	0.041	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Dichlorodifluoromethane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Freon 113	ND		0.58	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2-Dichloropropane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
2-Butanone	ND		0.58	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,1,2-Trichloroethane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
2-Nitropropane	ND	*	0.58	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Trichloroethene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Methyl acetate	ND		0.29	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50

Client Sample ID: B55-PDI-SB-17 (8-9)
Date Collected: 11/17/20 14:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-8
Matrix: Soil
Percent Solids: 82.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2,3-Trichlorobenzene	ND		0.58	0.29	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
o-Xylene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2-Dichlorobenzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2-Dibromo-3-Chloropropane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Acetonitrile	ND		5.8	1.5	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Isopropylbenzene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Chlorodifluoromethane	ND		0.58	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Cyclohexanone	ND		15	1.5	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Ethyl acetate	ND		0.29	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Ethyl ether	ND		0.29	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Isobutyl alcohol	ND		15	2.2	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Naphthalene	ND		0.29	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
n-Butanol	ND		15	3.3	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
n-Butylbenzene	ND		0.47	0.18	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
n-Heptane	ND		0.47	0.18	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
p-Isopropyltoluene	ND		0.29	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
sec-Butylbenzene	ND		0.29	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
t-Butyl alcohol	ND		5.8	0.88	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
tert-Butylbenzene	ND		0.29	0.047	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Tetrahydrofuran	ND		0.47	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Xylenes, Total	ND		0.58	0.082	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Hexane, 2,5-dimethyl-	*2.6*	*T J N*	*mg/Kg*	☼	*8.67*	*592-13-2*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
Cyclopentane, 1,2,4-trimethyl-, (1.alpha.,2.beta.,4.alpha.)-	*1.6*	*T J N*	*mg/Kg*	☼	*9.02*	*16883-48-0*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*1.6*	*T J*	*mg/Kg*	☼	*12.09*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*2.6*	*T J*	*mg/Kg*	☼	*12.22*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
2H-Quinolizin-2-ol, octahydro-, trans-	*1.5*	*T J N*	*mg/Kg*	☼	*12.62*	*31172-60-8*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*2.2*	*T J*	*mg/Kg*	☼	*12.97*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*1.9*	*T J*	*mg/Kg*	☼	*13.11*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*1.7*	*T J*	*mg/Kg*	☼	*13.25*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*1.6*	*T J*	*mg/Kg*	☼	*14.12*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
Benzene, 1-methyl-4-(1-methylpropyl)-	*2.3*	*T J N*	*mg/Kg*	☼	*14.33*	*1595-16-0*	*11/19/20 20:14*	*11/25/20 01:24*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*54 - 135*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
4-Bromofluorobenzene (Surr)	*89*		*50 - 131*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
Dibromofluoromethane (Surr)	*77*		*50 - 141*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
Toluene-d8 (Surr)	*79*		*52 - 141*	*11/19/20 20:14*	*11/25/20 01:24*	*50*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
1,2,4,5-Tetrachlorobenzene	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,2'-oxybis[1-chloropropane]	ND		0.052	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4,5-Trichlorophenol	ND		0.081	0.036	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1

Client Sample ID: B55-PDI-SB-17 (8-9)
Date Collected: 11/17/20 14:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-8
Matrix: Soil
Percent Solids: 82.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,6-Trichlorophenol	ND		0.068	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4-Dichlorophenol	ND		0.052	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4-Dimethylphenol	ND		0.081	0.036	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4-Dinitrophenol	ND		1.2	0.40	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4-Dinitrotoluene	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,6-Dinitrotoluene	ND		0.060	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Chloronaphthalene	ND		0.040	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Chlorophenol	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Methylnaphthalene	ND		0.040	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Methylphenol	ND		0.081	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Nitroaniline	ND		0.060	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Nitrophenol	ND		0.068	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
3,3'-Dichlorobenzidine	ND		0.40	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
3-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4,6-Dinitro-2-methylphenol	ND		0.60	0.28	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Bromophenyl-phenylether	ND		0.060	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Chloro-3-methylphenol	ND		0.060	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
3,4-Methylphenol	ND		0.060	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Nitrophenol	ND		0.60	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Acenaphthene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Acenaphthylene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Acetophenone	ND		0.060	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Anthracene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Atrazine	ND		0.52	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzaldehyde	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzo[a]anthracene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzo[a]pyrene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzo[b]fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzo[g,h,i]perylene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzo[k]fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Bis(2-chloroethoxy)methane	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Bis(2-chloroethyl)ether	ND		0.060	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Butylbenzylphthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Caprolactam	ND		0.20	0.040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Carbazole	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Chrysene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Di-n-butyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Di-n-octyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Dibenz(a,h)anthracene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Dibenzofuran	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Diethyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Dimethyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Chloroaniline	ND		0.20	0.040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Fluorene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Chlorophenyl-phenyl ether	ND		0.052	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Hexachlorobenzene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1

Client Sample ID: B55-PDI-SB-17 (8-9)
Date Collected: 11/17/20 14:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-8
Matrix: Soil
Percent Solids: 82.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachlorobutadiene	ND		0.093	0.044	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Hexachlorocyclopentadiene	ND		0.60	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Hexachloroethane	ND		0.20	0.040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Isophorone	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
N-Nitrosodi-n-propylamine	ND		0.060	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
N-Nitrosodiphenylamine	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Naphthalene	**0.010**	**J**	0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Nitrobenzene	ND		0.081	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Phenanthrene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Aniline	ND		0.60	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Phenol	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Pyrene	**0.0054**	**J**	0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Pentachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzyl alcohol	ND		0.60	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
n,n'-Dimethylaniline	ND		0.20	0.040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Pyridine	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Triethylamine	ND	*- *1	6.0	2.0	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
1,4-Dioxane	ND		0.40	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.2*	*T J B*	*mg/Kg*	☼	*3.89*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.34*	*T J*	*mg/Kg*	☼	*4.80*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.30*	*T J*	*mg/Kg*	☼	*4.84*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.38*	*T J*	*mg/Kg*	☼	*5.06*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.35*	*T J*	*mg/Kg*	☼	*5.67*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.38*	*T J*	*mg/Kg*	☼	*5.70*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Cyclopentane, hexyl-	*0.34*	*T J N*	*mg/Kg*	☼	*5.77*	*4457-00-5*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.43*	*T J*	*mg/Kg*	☼	*5.96*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.41*	*T J*	*mg/Kg*	☼	*6.31*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.30*	*T J*	*mg/Kg*	☼	*6.37*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.42*	*T J*	*mg/Kg*	☼	*6.50*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Benzene, pentamethyl-	*0.42*	*T J N*	*mg/Kg*	☼	*6.80*	*700-12-9*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.39*	*T J*	*mg/Kg*	☼	*6.96*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.34*	*T J*	*mg/Kg*	☼	*7.00*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.41*	*T J*	*mg/Kg*	☼	*7.03*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.42*	*T J*	*mg/Kg*	☼	*7.09*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.41*	*T J*	*mg/Kg*	☼	*7.22*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Tetradecane	*0.35*	*T J N*	*mg/Kg*	☼	*7.47*	*629-59-4*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*1.1*	*T J*	*mg/Kg*	☼	*8.23*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.30*	*T J*	*mg/Kg*	☼	*8.32*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.71*	*T J N*	*mg/Kg*	☼	*8.61*	*7560-83-0*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.33*	*T J*	*mg/Kg*	☼	*8.79*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.40*	*T J*	*mg/Kg*	☼	*9.75*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.37*	*T J*	*mg/Kg*	☼	*10.07*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Cyclic octaatomic sulfur	*0.44*	*T J N*	*mg/Kg*	☼	*11.15*	*10544-50-0*	*11/24/20 16:27*	*11/26/20 00:01*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*107*		*45 - 108*	*11/24/20 16:27*	*11/26/20 00:01*	*1*

Client Sample ID: B55-PDI-SB-17 (8-9)

Lab Sample ID: 410-21255-8

Date Collected: 11/17/20 14:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 82.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*75*		*32 - 97*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
2-Fluorophenol (Surr)	*86*		*26 - 96*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
2-Fluorobiphenyl (Surr)	*85*		*39 - 100*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
2,4,6-Tribromophenol (Surr)	*85*		*13 - 121*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Phenol-d5 (Surr)	*91*		*27 - 104*	*11/24/20 16:27*	*11/26/20 00:01*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**8.6**		7.2	2.4	mg/Kg	☼	11/24/20 16:27	12/02/20 16:56	3

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*91*		*45 - 108*	*11/24/20 16:27*	*12/02/20 16:56*	*3*
Nitrobenzene-d5 (Surr)	*65*		*32 - 97*	*11/24/20 16:27*	*12/02/20 16:56*	*3*
2-Fluorophenol (Surr)	*64*		*26 - 96*	*11/24/20 16:27*	*12/02/20 16:56*	*3*
2-Fluorobiphenyl (Surr)	*76*		*39 - 100*	*11/24/20 16:27*	*12/02/20 16:56*	*3*
2,4,6-Tribromophenol (Surr)	*66*		*13 - 121*	*11/24/20 16:27*	*12/02/20 16:56*	*3*
Phenol-d5 (Surr)	*66*		*27 - 104*	*11/24/20 16:27*	*12/02/20 16:56*	*3*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	H *	0.060	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:16	1
Formaldehyde	**0.22**	**H**	0.091	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:16	1
Glutaraldehyde	ND	H	0.060	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*107*		*77 - 133*	*11/20/20 13:08*	*11/24/20 00:16*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**17.2**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-06 (12-13)

Lab Sample ID: 410-21255-9

Date Collected: 11/17/20 14:45 Date Collected is 11/11/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 83.9

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,1,2,2-Tetrachloroethane	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,1,2-Trichloroethane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,1-Dichloroethane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,1-Dichloroethene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2,3-Trichlorobenzene	ND		0.0084	0.0042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2,4-Trichlorobenzene	ND		0.0084	0.0042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2,4-Trimethylbenzene	**0.00079**	**J**	0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2-Dibromo-3-Chloropropane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2-Dibromoethane	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2-Dichlorobenzene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2-Dichloroethane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2-Dichloropropane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,3,5-Trimethylbenzene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-06 (12-13)
Date Collected: 11/17/20 14:45
Date Received: 11/18/20 11:46

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-9
Matrix: Soil
Percent Solids: 83.9

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3-Dichlorobenzene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,4-Dichlorobenzene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,4-Dioxane	ND		0.21	0.031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
2-Butanone	ND		0.0084	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
2-Hexanone	ND		0.0084	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
2-Nitropropane	ND		0.0084	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
4-Methyl-2-pentanone	ND		0.0084	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Acetone	**0.049**		0.017	0.0050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Acetonitrile	ND		0.084	0.021	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Benzene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Bromochloromethane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Bromodichloromethane	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Bromoform	ND		0.0084	0.0042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Bromomethane	ND		0.0042	0.00059	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Carbon disulfide	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Carbon tetrachloride	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Chlorobenzene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Chlorodifluoromethane	ND		0.0084	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Chloroethane	ND		0.0042	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Chloroform	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Chloromethane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
cis-1,2-Dichloroethene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
cis-1,3-Dichloropropene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Cyclohexane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Cyclohexanone	**0.026**	**J**	0.21	0.021	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Dibromochloromethane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Dichlorodifluoromethane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Ethyl acetate	ND		0.0042	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Ethyl ether	ND		0.0042	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Ethylbenzene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Freon 113	ND		0.0084	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Isobutyl alcohol	ND		0.21	0.032	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Isopropylbenzene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
m&p-Xylene	ND		0.0042	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Methyl acetate	ND		0.0042	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Methyl tertiary butyl ether	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Methylcyclohexane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Methylene Chloride	ND		0.0042	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Naphthalene	ND		0.0042	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
n-Butanol	ND		0.21	0.047	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
n-Butylbenzene	ND		0.0067	0.0025	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
n-Heptane	ND		0.0067	0.0025	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
o-Xylene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
p-Isopropyltoluene	ND		0.0042	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
sec-Butylbenzene	ND		0.0042	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Styrene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
t-Butyl alcohol	ND		0.084	0.013	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
tert-Butylbenzene	ND		0.0042	0.00067	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Tetrachloroethene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1

Client Sample ID: B55-PDI-SB-06 (12-13)

Date Collected: 11/17/20 14:45
Date Received: 11/18/20 11:46

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-9

Matrix: Soil
Percent Solids: 83.9

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	ND		0.0067	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Toluene	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
trans-1,2-Dichloroethene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
trans-1,3-Dichloropropene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Trichloroethene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Trichlorofluoromethane	ND		0.0042	0.00059	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Vinyl chloride	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Xylenes, Total	ND		0.0084	0.0012	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*	☼			*11/18/20 22:22*	*11/24/20 17:47*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/18/20 22:22*	*11/24/20 17:47*	*1*
4-Bromofluorobenzene (Surr)	*97*		*50 - 131*	*11/18/20 22:22*	*11/24/20 17:47*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/18/20 22:22*	*11/24/20 17:47*	*1*
Toluene-d8 (Surr)	*101*		*52 - 141*	*11/18/20 22:22*	*11/24/20 17:47*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
1,2,4,5-Tetrachlorobenzene	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,2'-oxybis[1-chloropropane]	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4,5-Trichlorophenol	ND		0.079	0.036	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4,6-Trichlorophenol	ND		0.067	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4-Dichlorophenol	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4-Dimethylphenol	ND		0.079	0.036	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4-Dinitrophenol	ND		1.2	0.39	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4-Dinitrotoluene	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,6-Dinitrotoluene	ND		0.059	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Chloronaphthalene	ND		0.039	0.0079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Chlorophenol	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Methylnaphthalene	ND		0.039	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Methylphenol	ND		0.079	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Nitroaniline	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Nitrophenol	ND		0.067	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
3,3'-Dichlorobenzidine	ND		0.39	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
3-Nitroaniline	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4,6-Dinitro-2-methylphenol	ND		0.59	0.28	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Bromophenyl-phenylether	ND		0.059	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Chloro-3-methylphenol	ND		0.059	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
3,4-Methylphenol	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Nitroaniline	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Nitrophenol	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Acenaphthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Acenaphthylene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Acetophenone	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Anthracene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Atrazine	ND		0.51	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1

Client Sample ID: B55-PDI-SB-06 (12-13)
Date Collected: 11/17/20 14:45
Date Received: 11/18/20 11:46

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-9
Matrix: Soil
Percent Solids: 83.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzaldehyde	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzo[a]anthracene	ND		0.020	0.0079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzo[a]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzo[b]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzo[g,h,i]perylene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzo[k]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Bis(2-chloroethoxy)methane	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Bis(2-chloroethyl)ether	ND		0.059	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Butylbenzylphthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Caprolactam	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Carbazole	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Chrysene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Di-n-butyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Di-n-octyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Dibenz(a,h)anthracene	ND		0.020	0.0079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Dibenzofuran	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Diethyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Dimethyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Chloroaniline	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Fluorene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Chlorophenyl-phenyl ether	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Hexachlorobenzene	ND		0.020	0.0079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Hexachlorobutadiene	ND		0.091	0.043	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Hexachlorocyclopentadiene	ND		0.59	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Hexachloroethane	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Isophorone	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
N-Nitrosodi-n-propylamine	ND		0.059	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
N-Nitrosodiphenylamine	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Naphthalene	ND		0.020	0.0079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Nitrobenzene	ND		0.079	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Phenanthrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Aniline	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Phenol	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Pentachlorophenol	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzyl alcohol	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
n,n'-Dimethylaniline	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Pyridine	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Triethylamine	ND	*- *1	5.9	2.0	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
1,4-Dioxane	ND		0.39	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.7*	*T J*	*mg/Kg*	☼	*3.21*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*4.2*	*T J B*	*mg/Kg*	☼	*3.87*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
2-Cyclohexen-1-one	*0.37*	*T J N*	*mg/Kg*	☼	*4.78*	*930-68-7*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.51*	*T J*	*mg/Kg*	☼	*4.99*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
1,2,4-Trithiolane	*0.45*	*T J N*	*mg/Kg*	☼	*6.17*	*289-16-7*	*11/24/20 16:27*	*11/26/20 12:53*	*1*

Client Sample ID: B55-PDI-SB-06 (12-13)
Date Collected: 11/17/20 14:45
Date Received: 11/18/20 11:46

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-9
Matrix: Soil
Percent Solids: 83.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	0.40	T J	mg/Kg	☼	6.99		11/24/20 16:27	11/26/20 12:53	1
Cyclohexane, isothiocyanato-	0.21	T J N	mg/Kg	☼	7.04	1122-82-3	11/24/20 16:27	11/26/20 12:53	1
Unknown	0.47	T J	mg/Kg	☼	7.07		11/24/20 16:27	11/26/20 12:53	1
Unknown	0.19	T J	mg/Kg	☼	7.17		11/24/20 16:27	11/26/20 12:53	1
Unknown	0.18	T J	mg/Kg	☼	7.83		11/24/20 16:27	11/26/20 12:53	1
Unknown	1.4	T J	mg/Kg	☼	8.20		11/24/20 16:27	11/26/20 12:53	1
Unknown	1.2	T J	mg/Kg	☼	8.25		11/24/20 16:27	11/26/20 12:53	1
Unknown	2.0	T J	mg/Kg	☼	8.38		11/24/20 16:27	11/26/20 12:53	1
Unknown	0.53	T J	mg/Kg	☼	8.48		11/24/20 16:27	11/26/20 12:53	1
Unknown	0.59	T J	mg/Kg	☼	8.50		11/24/20 16:27	11/26/20 12:53	1
Unknown	0.76	T J	mg/Kg	☼	8.53		11/24/20 16:27	11/26/20 12:53	1
Unknown	0.47	T J	mg/Kg	☼	8.55		11/24/20 16:27	11/26/20 12:53	1
Cyclohexanamine, N-cyclohexyl-N-methyl-	4.1	T J N	mg/Kg	☼	8.59	7560-83-0	11/24/20 16:27	11/26/20 12:53	1
Unknown	0.34	T J	mg/Kg	☼	8.73		11/24/20 16:27	11/26/20 12:53	1
Unknown	0.27	T J	mg/Kg	☼	8.77		11/24/20 16:27	11/26/20 12:53	1
Unknown	0.40	T J	mg/Kg	☼	8.85		11/24/20 16:27	11/26/20 12:53	1
Lenthionine	2.1	T J N	mg/Kg	☼	9.31	292-46-6	11/24/20 16:27	11/26/20 12:53	1
Unknown	0.24	T J	mg/Kg	☼	9.35		11/24/20 16:27	11/26/20 12:53	1
Unknown	1.2	T J	mg/Kg	☼	9.73		11/24/20 16:27	11/26/20 12:53	1
Unknown	0.45	T J	mg/Kg	☼	10.05		11/24/20 16:27	11/26/20 12:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	100		45 - 108	11/24/20 16:27	11/26/20 12:53	1
Nitrobenzene-d5 (Surr)	69		32 - 97	11/24/20 16:27	11/26/20 12:53	1
2-Fluorophenol (Surr)	82		26 - 96	11/24/20 16:27	11/26/20 12:53	1
2-Fluorobiphenyl (Surr)	82		39 - 100	11/24/20 16:27	11/26/20 12:53	1
2,4,6-Tribromophenol (Surr)	70		13 - 121	11/24/20 16:27	11/26/20 12:53	1
Phenol-d5 (Surr)	85		27 - 104	11/24/20 16:27	11/26/20 12:53	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**13**		12	3.9	mg/Kg	☼	11/24/20 16:27	11/26/20 13:18	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	77		45 - 108	11/24/20 16:27	11/26/20 13:18	5
Nitrobenzene-d5 (Surr)	59		32 - 97	11/24/20 16:27	11/26/20 13:18	5
2-Fluorophenol (Surr)	67		26 - 96	11/24/20 16:27	11/26/20 13:18	5
2-Fluorobiphenyl (Surr)	69		39 - 100	11/24/20 16:27	11/26/20 13:18	5
2,4,6-Tribromophenol (Surr)	53		13 - 121	11/24/20 16:27	11/26/20 13:18	5
Phenol-d5 (Surr)	68		27 - 104	11/24/20 16:27	11/26/20 13:18	5

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	H *	0.060	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:27	1
Formaldehyde	**0.12**	**H**	0.089	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:27	1
Glutaraldehyde	ND	H	0.060	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	101		77 - 133	11/20/20 13:08	11/24/20 00:27	1

Client Sample ID: B55-PDI-SB-06 (12-13)

Date Collected: 11/17/20 14:45
Date Received: 11/18/20 11:46

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-9
Matrix: Soil
Percent Solids: 83.9

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	16.1		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: TB20083

Date Collected: 11/17/20 00:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-10
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			11/28/20 14:11	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			11/28/20 14:11	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			11/28/20 14:11	1
1,2,4-Trimethylbenzene	ND		5.0	1.0	ug/L			11/28/20 14:11	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			11/28/20 14:11	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			11/28/20 14:11	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,3,5-Trimethylbenzene	ND		5.0	0.30	ug/L			11/28/20 14:11	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
1,4-Dioxane	ND		250	29	ug/L			11/28/20 14:11	1
2-Butanone	ND		10	0.30	ug/L			11/28/20 14:11	1
2-Hexanone	ND		10	0.30	ug/L			11/28/20 14:11	1
2-Nitropropane	ND		10	0.80	ug/L			11/28/20 14:11	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			11/28/20 14:11	1
Acetone	ND		20	0.70	ug/L			11/28/20 14:11	1
Acetonitrile	ND		100	16	ug/L			11/28/20 14:11	1
Benzene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Bromochloromethane	ND		5.0	0.20	ug/L			11/28/20 14:11	1
Bromodichloromethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Bromoform	ND		4.0	1.0	ug/L			11/28/20 14:11	1
Bromomethane	ND	*	1.0	0.30	ug/L			11/28/20 14:11	1
Carbon disulfide	ND		5.0	0.20	ug/L			11/28/20 14:11	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Chlorobenzene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			11/28/20 14:11	1
Chloroethane	ND	*	1.0	0.20	ug/L			11/28/20 14:11	1
Chloroform	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Chloromethane	ND	*	1.0	0.20	ug/L			11/28/20 14:11	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Cyclohexane	ND		5.0	1.0	ug/L			11/28/20 14:11	1
Cyclohexanone	ND		100	25	ug/L			11/28/20 14:11	1
Dibromochloromethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Dichlorodifluoromethane	ND	*	1.0	0.20	ug/L			11/28/20 14:11	1
Ethyl acetate	ND		5.0	0.70	ug/L			11/28/20 14:11	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: TB20083
Date Collected: 11/17/20 00:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-10
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethyl ether	ND		5.0	0.20	ug/L			11/28/20 14:11	1
Ethylbenzene	ND		1.0	0.40	ug/L			11/28/20 14:11	1
Freon 113	ND		10	0.20	ug/L			11/28/20 14:11	1
Isobutyl alcohol	ND		250	36	ug/L			11/28/20 14:11	1
Isopropylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
m&p-Xylene	ND		5.0	1.0	ug/L			11/28/20 14:11	1
Methyl acetate	ND		5.0	0.30	ug/L			11/28/20 14:11	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Methylcyclohexane	ND		5.0	0.50	ug/L			11/28/20 14:11	1
Methylene Chloride	ND		1.0	0.30	ug/L			11/28/20 14:11	1
Naphthalene	ND		5.0	1.0	ug/L			11/28/20 14:11	1
n-Butanol	ND		250	61	ug/L			11/28/20 14:11	1
n-Butylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
n-Heptane	ND		5.0	2.0	ug/L			11/28/20 14:11	1
o-Xylene	ND		1.0	0.40	ug/L			11/28/20 14:11	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
Styrene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
t-Butyl alcohol	ND		50	12	ug/L			11/28/20 14:11	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			11/28/20 14:11	1
Tetrachloroethene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Tetrahydrofuran	ND		10	0.70	ug/L			11/28/20 14:11	1
Toluene	**0.31**	**J**	1.0	0.20	ug/L			11/28/20 14:11	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Trichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Vinyl chloride	ND	*	1.0	0.20	ug/L			11/28/20 14:11	1
Xylenes, Total	ND		6.0	1.4	ug/L			11/28/20 14:11	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*11/28/20 14:11*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*11/28/20 14:11*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*11/28/20 14:11*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*11/28/20 14:11*	*1*
Toluene-d8 (Surr)	*96*		*80 - 120*		*11/28/20 14:11*	*1*

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Groundwater

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)	(80-120)
410-21255-1	B55-PDI-SB-21	101	94	101	97
410-21255-1 MS	B55-PDI-SB-21	101	97	101	98
410-21255-1 MSD	B55-PDI-SB-21	100	98	101	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Soil

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(54-135)	(50-131)	(50-141)	(52-141)
410-21255-2	B55-PDI-SB-17 (9-10)	104	100	99	102
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	99	98	99	103
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	97	96	97	102
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	100	97	99	102
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	81	85	81	83
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	101	96	100	101
410-21255-8	B55-PDI-SB-17 (8-9)	75	89	77	79
410-21255-9	B55-PDI-SB-06 (12-13)	100	97	99	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(54-135)	(50-131)	(50-141)	(52-141)
LCS 410-69809/5	Lab Control Sample	102	100	100	101
LCS 410-69809/7	Lab Control Sample	106	99	100	100
LCS 410-70130/5	Lab Control Sample	100	91	99	97
LCS 410-70130/7	Lab Control Sample	94	91	92	94
LCSD 410-69809/6	Lab Control Sample Dup	101	100	100	100
LCSD 410-69809/8	Lab Control Sample Dup	102	99	100	101
LCSD 410-70130/6	Lab Control Sample Dup	100	90	98	97
LCSD 410-70130/8	Lab Control Sample Dup	97	92	94	96
MB 410-69809/10	Method Blank	105	99	100	101
MB 410-70130/9	Method Blank	98	89	95	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)	(80-120)
410-21255-10	TB20083	101	93	101	96
LCS 410-70702/5	Lab Control Sample	100	98	100	98
LCS 410-70702/7	Lab Control Sample	100	94	99	97
LCSD 410-70702/6	Lab Control Sample Dup	99	98	100	99
LCSD 410-70702/8	Lab Control Sample Dup	100	95	100	96
MB 410-70702/10	Method Blank	99	95	99	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Groundwater — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(10-150)	(44-102)	(10-84)	(23-128)	(31-113)	(10-67)
410-21255-1	B55-PDI-SB-21	72	69	33	69	62	26

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Soil — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TPHd14	NBZ	2FP	FBP	TBP	PHL
Lab Sample ID	Client Sample ID	(45-108)	(32-97)	(26-96)	(39-100)	(13-121)	(27-104)
410-21255-2	B55-PDI-SB-17 (9-10)	100	68	83	84	88	88
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	101	62	82	82	72	87
410-21255-3 - DL	B55-PDI-SB-19 (11.6-12.6)	93	60	75	76	67	78
410-21255-3 MS	B55-PDI-SB-19 (11.6-12.6)	92	67	80	83	81	83
410-21255-3 MSD	B55-PDI-SB-19 (11.6-12.6)	83	55	67	71	71	72
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	73	71	82	73	83	79
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	106	65	83	82	69	87
410-21255-5 - DL	B55-PDI-SB-19 (12.6-13.6)	82	52	62	64	51	63
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	106	74	87	84	81	89
410-21255-6 - DL	B55-PDI-SB-18 (9.5-10.5)	83	61	63	67	57	65
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	102	68	84	85	65	87
410-21255-8	B55-PDI-SB-17 (8-9)	107	75	86	85	85	91
410-21255-8 - DL	B55-PDI-SB-17 (8-9)	91	65	64	76	66	66
410-21255-9	B55-PDI-SB-06 (12-13)	100	69	82	82	70	85
410-21255-9 - DL	B55-PDI-SB-06 (12-13)	77	59	67	69	53	68

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Surrogate Legend

TPHd14 = p-Terphenyl-d14 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
2FP = 2-Fluorophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(13-121)	(39-100)	(26-96)	(32-97)	(45-108)	(27-104)
LCS 410-70093/2-A	Lab Control Sample	98	85	86	70	101	92
LCS 410-70093/3-A	Lab Control Sample	94	87	83	73	109 S1+	84
LCSD 410-70093/4-A	Lab Control Sample Dup	99	86	84	70	117 S1+	85
MB 410-70093/1-A	Method Blank	84	82	77	69	107	78

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(10-150)	(44-102)	(10-84)	(23-128)	(31-113)	(10-67)
LCS 410-69548/2-A	Lab Control Sample	75	58	41	74	85	33
LCS 410-69548/5-A	Lab Control Sample	75	51	32	66	89	25
LCSD 410-69548/6-A	Lab Control Sample Dup	73	52	36	74	89	28
MB 410-69548/1-A	Method Blank	74	60	30	69	89	23

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Groundwater **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BTRA
Lab Sample ID	Client Sample ID	(39-153)
410-21255-1	B55-PDI-SB-21	106

Surrogate Legend

BTRA = Butyraldehyde

Surrogate Summary

Client: ARCADIS U.S. Inc
Job ID: 410-21255-1
Project/Site: Bristol-Myers Squibb

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Soil **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BTRA
Lab Sample ID	Client Sample ID	(77-133)
410-21255-2	B55-PDI-SB-17 (9-10)	108
410-21255-2 MS	B55-PDI-SB-17 (9-10)	105
410-21255-2 MSD	B55-PDI-SB-17 (9-10)	103
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	108
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	106
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	107
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	116
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	94
410-21255-8	B55-PDI-SB-17 (8-9)	107
410-21255-9	B55-PDI-SB-06 (12-13)	101

Surrogate Legend
BTRA = Butyraldehyde

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BTRA
Lab Sample ID	Client Sample ID	(77-133)
LCS 410-68419/2-A	Lab Control Sample	108
LCS 410-70762/2-A	Lab Control Sample	100
MB 410-68419/1-A	Method Blank	113
MB 410-70762/1-A	Method Blank	83

Surrogate Legend
BTRA = Butyraldehyde

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BTRA
Lab Sample ID	Client Sample ID	(39-153)
LCS 410-68417/2-A	Lab Control Sample	97
LCSD 410-68417/3-A	Lab Control Sample Dup	94
MB 410-68417/1-A	Method Blank	98

Surrogate Legend
BTRA = Butyraldehyde

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
1,2,4-Trimethylbenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2-Dichloroethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
1,2,4-Trichlorobenzene	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
1,4-Dichlorobenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
1,4-Dioxane	ND		0.25	0.037	mg/Kg			11/24/20 11:24	1
4-Methyl-2-pentanone	ND		0.010	0.0010	mg/Kg			11/24/20 11:24	1
1,3,5-Trimethylbenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,3-Dichlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
2-Hexanone	ND		0.010	0.0010	mg/Kg			11/24/20 11:24	1
Acetone	ND		0.020	0.0060	mg/Kg			11/24/20 11:24	1
Benzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1,1-Trichloroethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Bromomethane	ND		0.0050	0.00070	mg/Kg			11/24/20 11:24	1
Carbon tetrachloride	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Chlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Bromochloromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Chloroethane	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Chloroform	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Chloromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Carbon disulfide	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
cis-1,2-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Bromoform	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
cis-1,3-Dichloropropene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Bromodichloromethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Cyclohexane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1-Dichloroethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Dibromochloromethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Dichlorodifluoromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
1,2-Dichloropropane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Ethylbenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
2-Butanone	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
Freon 113	ND		0.010	0.00060	mg/Kg			11/24/20 11:24	1
1,1,2-Trichloroethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
2-Nitropropane	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
m&p-Xylene	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Methyl acetate	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
1,1,2,2-Tetrachloroethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Methyl tertiary butyl ether	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2,3-Trichlorobenzene	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
Methylcyclohexane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Methylene Chloride	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
1,2-Dichlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2-Dibromo-3-Chloropropane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Acetonitrile	ND		0.10	0.025	mg/Kg			11/24/20 11:24	1
Isopropylbenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
o-Xylene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorodifluoromethane	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
Styrene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Cyclohexanone	ND		0.25	0.025	mg/Kg			11/24/20 11:24	1
Ethyl acetate	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Ethyl ether	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Tetrachloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Isobutyl alcohol	ND		0.25	0.038	mg/Kg			11/24/20 11:24	1
Naphthalene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
Toluene	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
n-Butanol	ND		0.25	0.056	mg/Kg			11/24/20 11:24	1
trans-1,2-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
n-Butylbenzene	ND		0.0080	0.0030	mg/Kg			11/24/20 11:24	1
trans-1,3-Dichloropropene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
n-Heptane	ND		0.0080	0.0030	mg/Kg			11/24/20 11:24	1
Trichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Trichlorofluoromethane	ND		0.0050	0.00070	mg/Kg			11/24/20 11:24	1
p-Isopropyltoluene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
Vinyl chloride	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
sec-Butylbenzene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
t-Butyl alcohol	ND		0.10	0.015	mg/Kg			11/24/20 11:24	1
tert-Butylbenzene	ND		0.0050	0.00080	mg/Kg			11/24/20 11:24	1
Tetrahydrofuran	ND		0.0080	0.0010	mg/Kg			11/24/20 11:24	1
Xylenes, Total	ND		0.010	0.0014	mg/Kg			11/24/20 11:24	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*					*11/24/20 11:24*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*54 - 135*		*11/24/20 11:24*	*1*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*		*11/24/20 11:24*	*1*
Dibromofluoromethane (Surr)	*100*		*50 - 141*		*11/24/20 11:24*	*1*
Toluene-d8 (Surr)	*101*		*52 - 141*		*11/24/20 11:24*	*1*

Lab Sample ID: LCS 410-69809/5
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	0.0200	0.0215		mg/Kg		107	76 - 120
1,2,4-Trimethylbenzene	0.0200	0.0223		mg/Kg		111	73 - 120
1,2-Dichloroethane	0.0200	0.0215		mg/Kg		107	71 - 128
1,2,4-Trichlorobenzene	0.0200	0.0219		mg/Kg		109	56 - 130
1,4-Dichlorobenzene	0.0200	0.0216		mg/Kg		108	80 - 120
1,4-Dioxane	0.500	0.559		mg/Kg		112	62 - 131
4-Methyl-2-pentanone	0.100	0.109		mg/Kg		109	67 - 128
1,3,5-Trimethylbenzene	0.0200	0.0222		mg/Kg		111	73 - 120
1,3-Dichlorobenzene	0.0200	0.0217		mg/Kg		109	75 - 120
2-Hexanone	0.100	0.108		mg/Kg		108	54 - 140

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69809/5
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	0.150	0.142		mg/Kg		95	41 - 150
Benzene	0.0200	0.0211		mg/Kg		105	80 - 120
1,1,1-Trichloroethane	0.0200	0.0212		mg/Kg		106	69 - 123
Bromomethane	0.0200	0.0219		mg/Kg		110	45 - 140
Carbon tetrachloride	0.0200	0.0211		mg/Kg		105	64 - 134
Chlorobenzene	0.0200	0.0212		mg/Kg		106	80 - 120
Bromochloromethane	0.0200	0.0210		mg/Kg		105	72 - 124
Chloroethane	0.0200	0.0205		mg/Kg		102	43 - 135
Chloroform	0.0200	0.0217		mg/Kg		109	80 - 120
Chloromethane	0.0200	0.0178		mg/Kg		89	56 - 120
Carbon disulfide	0.0200	0.0214		mg/Kg		107	64 - 133
cis-1,2-Dichloroethene	0.0200	0.0222		mg/Kg		111	80 - 125
Bromoform	0.0200	0.0195		mg/Kg		98	51 - 127
cis-1,3-Dichloropropene	0.0200	0.0210		mg/Kg		105	66 - 120
Bromodichloromethane	0.0200	0.0208		mg/Kg		104	70 - 120
Cyclohexane	0.0200	0.0209		mg/Kg		105	58 - 126
1,1-Dichloroethane	0.0200	0.0214		mg/Kg		107	79 - 120
1,1-Dichloroethene	0.0200	0.0226		mg/Kg		113	73 - 129
Dibromochloromethane	0.0200	0.0212		mg/Kg		106	69 - 125
Dichlorodifluoromethane	0.0200	0.0144		mg/Kg		72	21 - 127
1,2-Dichloropropane	0.0200	0.0218		mg/Kg		109	80 - 120
Ethylbenzene	0.0200	0.0217		mg/Kg		109	78 - 120
2-Butanone	0.150	0.155		mg/Kg		104	57 - 128
Freon 113	0.0200	0.0189		mg/Kg		95	64 - 135
1,1,2-Trichloroethane	0.0200	0.0219		mg/Kg		110	80 - 120
2-Nitropropane	0.0200	0.0166		mg/Kg		83	27 - 183
m&p-Xylene	0.0400	0.0432		mg/Kg		108	80 - 120
Methyl acetate	0.0200	0.0193		mg/Kg		97	67 - 128
1,1,2,2-Tetrachloroethane	0.0200	0.0217		mg/Kg		109	69 - 125
Methyl tertiary butyl ether	0.0200	0.0213		mg/Kg		106	72 - 120
1,2,3-Trichlorobenzene	0.0200	0.0221		mg/Kg		111	57 - 131
Methylcyclohexane	0.0200	0.0195		mg/Kg		98	61 - 124
Methylene Chloride	0.0200	0.0209		mg/Kg		104	76 - 122
1,2-Dichlorobenzene	0.0200	0.0216		mg/Kg		108	76 - 120
1,2-Dibromo-3-Chloropropane	0.0200	0.0206		mg/Kg		103	48 - 134
Isopropylbenzene	0.0200	0.0224		mg/Kg		112	77 - 120
o-Xylene	0.0200	0.0211		mg/Kg		106	75 - 120
Styrene	0.0200	0.0207		mg/Kg		104	76 - 120
Cyclohexanone	0.500	0.379		mg/Kg		76	47 - 136
Tetrachloroethene	0.0200	0.0208		mg/Kg		104	73 - 120
Isobutyl alcohol	0.500	0.519		mg/Kg		104	69 - 129
Naphthalene	0.0200	0.0218		mg/Kg		109	48 - 130
Toluene	0.0200	0.0214		mg/Kg		107	80 - 120
n-Butanol	1.00	1.01		mg/Kg		101	63 - 123
trans-1,2-Dichloroethene	0.0200	0.0216		mg/Kg		108	80 - 126
n-Butylbenzene	0.0200	0.0207		mg/Kg		103	71 - 121
trans-1,3-Dichloropropene	0.0200	0.0209		mg/Kg		104	68 - 122
n-Heptane	0.0200	0.0210		mg/Kg		105	50 - 141
Trichloroethene	0.0200	0.0213		mg/Kg		106	80 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69809/5
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Trichlorofluoromethane	0.0200	0.0186		mg/Kg		93	55 - 134
p-Isopropyltoluene	0.0200	0.0219		mg/Kg		109	72 - 120
Vinyl chloride	0.0200	0.0182		mg/Kg		91	52 - 120
sec-Butylbenzene	0.0200	0.0215		mg/Kg		108	72 - 120
t-Butyl alcohol	0.200	0.207		mg/Kg		103	74 - 121
tert-Butylbenzene	0.0200	0.0200		mg/Kg		100	68 - 120
Tetrahydrofuran	0.100	0.104		mg/Kg		104	71 - 127
Xylenes, Total	0.0600	0.0643		mg/Kg		107	75 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*54 - 135*
4-Bromofluorobenzene (Surr)	*100*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*101*		*52 - 141*

Lab Sample ID: LCS 410-69809/7
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetonitrile	0.150	0.127		mg/Kg		85	61 - 120
Chlorodifluoromethane	0.0200	0.0182		mg/Kg		91	60 - 133
Ethyl acetate	0.0200	0.0237		mg/Kg		118	65 - 133
Ethyl ether	0.0200	0.0252		mg/Kg		126	59 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*106*		*54 - 135*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*100*		*52 - 141*

Lab Sample ID: LCSD 410-69809/6
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane	0.0200	0.0206		mg/Kg		103	76 - 120	4	30
1,2,4-Trimethylbenzene	0.0200	0.0217		mg/Kg		109	73 - 120	2	30
1,2-Dichloroethane	0.0200	0.0204		mg/Kg		102	71 - 128	5	30
1,2,4-Trichlorobenzene	0.0200	0.0213		mg/Kg		106	56 - 130	3	30
1,4-Dichlorobenzene	0.0200	0.0208		mg/Kg		104	80 - 120	4	30
1,4-Dioxane	0.500	0.498		mg/Kg		100	62 - 131	12	30
4-Methyl-2-pentanone	0.100	0.102		mg/Kg		102	67 - 128	7	30
1,3,5-Trimethylbenzene	0.0200	0.0216		mg/Kg		108	73 - 120	3	30
1,3-Dichlorobenzene	0.0200	0.0207		mg/Kg		103	75 - 120	5	30
2-Hexanone	0.100	0.101		mg/Kg		101	54 - 140	7	30
Acetone	0.150	0.142		mg/Kg		95	41 - 150	0	30
Benzene	0.0200	0.0206		mg/Kg		103	80 - 120	2	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69809/6
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	0.0200	0.0208		mg/Kg		104	69 - 123	2	30
Bromomethane	0.0200	0.0210		mg/Kg		105	45 - 140	4	30
Carbon tetrachloride	0.0200	0.0207		mg/Kg		104	64 - 134	2	30
Chlorobenzene	0.0200	0.0208		mg/Kg		104	80 - 120	2	30
Bromochloromethane	0.0200	0.0201		mg/Kg		101	72 - 124	4	30
Chloroethane	0.0200	0.0201		mg/Kg		100	43 - 135	2	30
Chloroform	0.0200	0.0208		mg/Kg		104	80 - 120	4	30
Chloromethane	0.0200	0.0174		mg/Kg		87	56 - 120	2	30
Carbon disulfide	0.0200	0.0208		mg/Kg		104	64 - 133	3	30
cis-1,2-Dichloroethene	0.0200	0.0220		mg/Kg		110	80 - 125	1	30
Bromoform	0.0200	0.0183		mg/Kg		91	51 - 127	7	30
cis-1,3-Dichloropropene	0.0200	0.0201		mg/Kg		101	66 - 120	4	30
Bromodichloromethane	0.0200	0.0204		mg/Kg		102	70 - 120	2	30
Cyclohexane	0.0200	0.0208		mg/Kg		104	58 - 126	0	30
1,1-Dichloroethane	0.0200	0.0210		mg/Kg		105	79 - 120	2	30
1,1-Dichloroethene	0.0200	0.0223		mg/Kg		112	73 - 129	1	30
Dibromochloromethane	0.0200	0.0205		mg/Kg		102	69 - 125	3	30
Dichlorodifluoromethane	0.0200	0.0140		mg/Kg		70	21 - 127	3	30
1,2-Dichloropropane	0.0200	0.0211		mg/Kg		105	80 - 120	3	30
Ethylbenzene	0.0200	0.0212		mg/Kg		106	78 - 120	2	30
2-Butanone	0.150	0.144		mg/Kg		96	57 - 128	8	30
Freon 113	0.0200	0.0191		mg/Kg		96	64 - 135	1	30
1,1,2-Trichloroethane	0.0200	0.0211		mg/Kg		106	80 - 120	4	30
2-Nitropropane	0.0200	0.0181		mg/Kg		91	27 - 183	8	30
m&p-Xylene	0.0400	0.0419		mg/Kg		105	80 - 120	3	30
Methyl acetate	0.0200	0.0177		mg/Kg		89	67 - 128	9	30
1,1,2,2-Tetrachloroethane	0.0200	0.0203		mg/Kg		102	69 - 125	7	30
Methyl tertiary butyl ether	0.0200	0.0200		mg/Kg		100	72 - 120	6	30
1,2,3-Trichlorobenzene	0.0200	0.0211		mg/Kg		106	57 - 131	5	30
Methylcyclohexane	0.0200	0.0192		mg/Kg		96	61 - 124	2	30
Methylene Chloride	0.0200	0.0206		mg/Kg		103	76 - 122	1	30
1,2-Dichlorobenzene	0.0200	0.0209		mg/Kg		105	76 - 120	3	30
1,2-Dibromo-3-Chloropropane	0.0200	0.0196		mg/Kg		98	48 - 134	5	30
Isopropylbenzene	0.0200	0.0219		mg/Kg		109	77 - 120	2	30
o-Xylene	0.0200	0.0205		mg/Kg		103	75 - 120	3	30
Styrene	0.0200	0.0201		mg/Kg		101	76 - 120	3	30
Cyclohexanone	0.500	0.354		mg/Kg		71	47 - 136	7	30
Tetrachloroethene	0.0200	0.0205		mg/Kg		102	73 - 120	2	30
Isobutyl alcohol	0.500	0.490		mg/Kg		98	69 - 129	6	30
Naphthalene	0.0200	0.0204		mg/Kg		102	48 - 130	7	30
Toluene	0.0200	0.0206		mg/Kg		103	80 - 120	4	30
n-Butanol	1.00	0.938		mg/Kg		94	63 - 123	7	30
trans-1,2-Dichloroethene	0.0200	0.0212		mg/Kg		106	80 - 126	2	30
n-Butylbenzene	0.0200	0.0203		mg/Kg		101	71 - 121	2	30
trans-1,3-Dichloropropene	0.0200	0.0202		mg/Kg		101	68 - 122	3	30
n-Heptane	0.0200	0.0208		mg/Kg		104	50 - 141	1	30
Trichloroethene	0.0200	0.0209		mg/Kg		104	80 - 120	2	30
Trichlorofluoromethane	0.0200	0.0183		mg/Kg		92	55 - 134	2	30
p-Isopropyltoluene	0.0200	0.0211		mg/Kg		105	72 - 120	4	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69809/6
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride			0.0200	0.0181		mg/Kg		91	52 - 120	1	30
sec-Butylbenzene			0.0200	0.0212		mg/Kg		106	72 - 120	2	30
t-Butyl alcohol			0.200	0.194		mg/Kg		97	74 - 121	6	30
tert-Butylbenzene			0.0200	0.0199		mg/Kg		99	68 - 120	0	30
Tetrahydrofuran			0.100	0.101		mg/Kg		101	71 - 127	3	30
Xylenes, Total			0.0600	0.0624		mg/Kg		104	75 - 120	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*54 - 135*
4-Bromofluorobenzene (Surr)	*100*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*100*		*52 - 141*

Lab Sample ID: LCSD 410-69809/8
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetonitrile			0.150	0.144		mg/Kg		96	61 - 120	12	30
Chlorodifluoromethane			0.0200	0.0229		mg/Kg		115	60 - 133	23	30
Ethyl acetate			0.0200	0.0201		mg/Kg		101	65 - 133	16	30
Ethyl ether			0.0200	0.0240		mg/Kg		120	59 - 135	5	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*54 - 135*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*101*		*52 - 141*

Lab Sample ID: MB 410-70130/9
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
1,2,4-Trimethylbenzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,2-Dichloroethane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
1,2,4-Trichlorobenzene	ND		0.50	0.25	mg/Kg			11/24/20 21:22	50
1,4-Dichlorobenzene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
1,4-Dioxane	ND		13	1.9	mg/Kg			11/24/20 21:22	50
4-Methyl-2-pentanone	ND		0.50	0.050	mg/Kg			11/24/20 21:22	50
1,3,5-Trimethylbenzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,3-Dichlorobenzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
2-Hexanone	ND		0.50	0.050	mg/Kg			11/24/20 21:22	50
Acetone	ND		1.0	0.30	mg/Kg			11/24/20 21:22	50
Benzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,1,1-Trichloroethane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
Bromomethane	ND		0.25	0.035	mg/Kg			11/24/20 21:22	50

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-70130/9
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Chlorobenzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Bromochloromethane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
Chloroethane	ND		0.25	0.050	mg/Kg			11/24/20 21:22	50
Chloroform	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
Chloromethane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
Carbon disulfide	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
cis-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Bromoform	ND		0.50	0.25	mg/Kg			11/24/20 21:22	50
cis-1,3-Dichloropropene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
Bromodichloromethane	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
Cyclohexane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,1-Dichloroethane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,1-Dichloroethene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Dibromochloromethane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Dichlorodifluoromethane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
1,2-Dichloropropane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Ethylbenzene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
2-Butanone	ND		0.50	0.10	mg/Kg			11/24/20 21:22	50
Freon 113	ND		0.50	0.030	mg/Kg			11/24/20 21:22	50
1,1,2-Trichloroethane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
2-Nitropropane	ND		0.50	0.10	mg/Kg			11/24/20 21:22	50
m&p-Xylene	ND		0.25	0.050	mg/Kg			11/24/20 21:22	50
Methyl acetate	ND		0.25	0.050	mg/Kg			11/24/20 21:22	50
1,1,2,2-Tetrachloroethane	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
Methyl tertiary butyl ether	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,2,3-Trichlorobenzene	ND		0.50	0.25	mg/Kg			11/24/20 21:22	50
Methylcyclohexane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
Methylene Chloride	ND		0.25	0.10	mg/Kg			11/24/20 21:22	50
1,2-Dichlorobenzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,2-Dibromo-3-Chloropropane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Acetonitrile	ND		5.0	1.3	mg/Kg			11/24/20 21:22	50
Isopropylbenzene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
o-Xylene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
Chlorodifluoromethane	ND		0.50	0.10	mg/Kg			11/24/20 21:22	50
Styrene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
Cyclohexanone	ND		13	1.3	mg/Kg			11/24/20 21:22	50
Ethyl acetate	ND		0.25	0.050	mg/Kg			11/24/20 21:22	50
Ethyl ether	ND		0.25	0.050	mg/Kg			11/24/20 21:22	50
Tetrachloroethene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Isobutyl alcohol	ND		13	1.9	mg/Kg			11/24/20 21:22	50
Naphthalene	ND		0.25	0.10	mg/Kg			11/24/20 21:22	50
Toluene	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
n-Butanol	ND		13	2.8	mg/Kg			11/24/20 21:22	50
trans-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
n-Butylbenzene	ND		0.40	0.15	mg/Kg			11/24/20 21:22	50
trans-1,3-Dichloropropene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
n-Heptane	ND		0.40	0.15	mg/Kg			11/24/20 21:22	50
Trichloroethene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-70130/9
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichlorofluoromethane	ND		0.25	0.035	mg/Kg			11/24/20 21:22	50
p-Isopropyltoluene	ND		0.25	0.10	mg/Kg			11/24/20 21:22	50
Vinyl chloride	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
sec-Butylbenzene	ND		0.25	0.10	mg/Kg			11/24/20 21:22	50
t-Butyl alcohol	ND		5.0	0.75	mg/Kg			11/24/20 21:22	50
tert-Butylbenzene	ND		0.25	0.040	mg/Kg			11/24/20 21:22	50
Tetrahydrofuran	ND		0.40	0.050	mg/Kg			11/24/20 21:22	50
Xylenes, Total	ND		0.50	0.070	mg/Kg			11/24/20 21:22	50

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*					*11/24/20 21:22*	*50*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*54 - 135*		*11/24/20 21:22*	*50*
4-Bromofluorobenzene (Surr)	*89*		*50 - 131*		*11/24/20 21:22*	*50*
Dibromofluoromethane (Surr)	*95*		*50 - 141*		*11/24/20 21:22*	*50*
Toluene-d8 (Surr)	*96*		*52 - 141*		*11/24/20 21:22*	*50*

Lab Sample ID: LCS 410-70130/5
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	1.00	1.06		mg/Kg		106	76 - 120
1,2,4-Trimethylbenzene	1.00	0.943		mg/Kg		94	73 - 120
1,2-Dichloroethane	1.00	0.979		mg/Kg		98	71 - 128
1,2,4-Trichlorobenzene	1.00	0.939		mg/Kg		94	56 - 130
1,4-Dichlorobenzene	1.00	1.00		mg/Kg		100	80 - 120
1,4-Dioxane	25.0	24.1		mg/Kg		96	62 - 131
4-Methyl-2-pentanone	5.00	4.96		mg/Kg		99	67 - 128
1,3,5-Trimethylbenzene	1.00	0.957		mg/Kg		96	73 - 120
1,3-Dichlorobenzene	1.00	0.988		mg/Kg		99	75 - 120
2-Hexanone	5.00	4.24		mg/Kg		85	54 - 140
Acetone	7.50	4.36		mg/Kg		58	41 - 150
Benzene	1.00	0.998		mg/Kg		100	80 - 120
1,1,1-Trichloroethane	1.00	1.09		mg/Kg		109	69 - 123
Bromomethane	1.00	1.10		mg/Kg		110	45 - 140
Carbon tetrachloride	1.00	1.22		mg/Kg		122	64 - 134
Chlorobenzene	1.00	1.01		mg/Kg		101	80 - 120
Bromochloromethane	1.00	0.969		mg/Kg		97	72 - 124
Chloroethane	1.00	0.787		mg/Kg		79	43 - 135
Chloroform	1.00	1.00		mg/Kg		100	80 - 120
Chloromethane	1.00	0.786		mg/Kg		79	56 - 120
Carbon disulfide	1.00	1.01		mg/Kg		101	64 - 133
cis-1,2-Dichloroethene	1.00	1.06		mg/Kg		106	80 - 125
Bromoform	1.00	1.28	*	mg/Kg		128	51 - 127
cis-1,3-Dichloropropene	1.00	1.13		mg/Kg		113	66 - 120
Bromodichloromethane	1.00	1.12		mg/Kg		112	70 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-70130/5
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyclohexane	1.00	0.942		mg/Kg		94	58 - 126
1,1-Dichloroethane	1.00	0.994		mg/Kg		99	79 - 120
1,1-Dichloroethene	1.00	1.02		mg/Kg		102	73 - 129
Dibromochloromethane	1.00	1.16		mg/Kg		116	69 - 125
Dichlorodifluoromethane	1.00	0.790		mg/Kg		79	21 - 127
1,2-Dichloropropane	1.00	1.01		mg/Kg		101	80 - 120
Ethylbenzene	1.00	0.979		mg/Kg		98	78 - 120
2-Butanone	7.50	4.94		mg/Kg		66	57 - 128
Freon 113	1.00	0.946		mg/Kg		95	64 - 135
1,1,2-Trichloroethane	1.00	1.04		mg/Kg		104	80 - 120
2-Nitropropane	1.00	2.21	*	mg/Kg		221	27 - 183
m&p-Xylene	2.00	2.00		mg/Kg		100	80 - 120
Methyl acetate	1.00	1.10		mg/Kg		110	67 - 128
1,1,2,2-Tetrachloroethane	1.00	0.970		mg/Kg		97	69 - 125
Methyl tertiary butyl ether	1.00	0.955		mg/Kg		95	72 - 120
1,2,3-Trichlorobenzene	1.00	0.817		mg/Kg		82	57 - 131
Methylcyclohexane	1.00	0.945		mg/Kg		95	61 - 124
Methylene Chloride	1.00	1.01		mg/Kg		101	76 - 122
1,2-Dichlorobenzene	1.00	0.968		mg/Kg		97	76 - 120
1,2-Dibromo-3-Chloropropane	1.00	0.807		mg/Kg		81	48 - 134
Isopropylbenzene	1.00	0.969		mg/Kg		97	77 - 120
o-Xylene	1.00	0.988		mg/Kg		99	75 - 120
Styrene	1.00	1.01		mg/Kg		101	76 - 120
Cyclohexanone	25.0	19.9		mg/Kg		80	47 - 136
Tetrachloroethene	1.00	1.06		mg/Kg		106	73 - 120
Isobutyl alcohol	25.0	26.4		mg/Kg		105	69 - 129
Naphthalene	1.00	0.791		mg/Kg		79	48 - 130
Toluene	1.00	0.995		mg/Kg		100	80 - 120
n-Butanol	50.0	50.4		mg/Kg		101	63 - 123
trans-1,2-Dichloroethene	1.00	1.02		mg/Kg		102	80 - 126
n-Butylbenzene	1.00	0.923		mg/Kg		92	71 - 121
trans-1,3-Dichloropropene	1.00	1.07		mg/Kg		107	68 - 122
n-Heptane	1.00	0.965		mg/Kg		96	50 - 141
Trichloroethene	1.00	1.01		mg/Kg		101	80 - 120
Trichlorofluoromethane	1.00	0.887		mg/Kg		89	55 - 134
p-Isopropyltoluene	1.00	0.968		mg/Kg		97	72 - 120
Vinyl chloride	1.00	0.825		mg/Kg		83	52 - 120
sec-Butylbenzene	1.00	0.951		mg/Kg		95	72 - 120
t-Butyl alcohol	10.0	10.4		mg/Kg		104	74 - 121
tert-Butylbenzene	1.00	0.983		mg/Kg		98	68 - 120
Tetrahydrofuran	5.00	3.75		mg/Kg		75	71 - 127
Xylenes, Total	3.00	2.99		mg/Kg		100	75 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*
4-Bromofluorobenzene (Surr)	*91*		*50 - 131*
Dibromofluoromethane (Surr)	*99*		*50 - 141*
Toluene-d8 (Surr)	*97*		*52 - 141*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-70130/7
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Acetonitrile			7.50	7.04		mg/Kg		94	61 - 120		
Chlorodifluoromethane			1.00	0.808		mg/Kg		81	60 - 133		
Ethyl acetate			1.00	0.938		mg/Kg		94	65 - 133		
Ethyl ether			1.00	1.06		mg/Kg		106	59 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*54 - 135*
4-Bromofluorobenzene (Surr)	*91*		*50 - 131*
Dibromofluoromethane (Surr)	*92*		*50 - 141*
Toluene-d8 (Surr)	*94*		*52 - 141*

Lab Sample ID: LCSD 410-70130/6
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane			1.00	1.06		mg/Kg		106	76 - 120	0	30
1,2,4-Trimethylbenzene			1.00	0.948		mg/Kg		95	73 - 120	1	30
1,2-Dichloroethane			1.00	0.987		mg/Kg		99	71 - 128	1	30
1,2,4-Trichlorobenzene			1.00	0.938		mg/Kg		94	56 - 130	0	30
1,4-Dichlorobenzene			1.00	0.997		mg/Kg		100	80 - 120	1	30
1,4-Dioxane			25.0	25.6		mg/Kg		103	62 - 131	6	30
4-Methyl-2-pentanone			5.00	4.88		mg/Kg		98	67 - 128	2	30
1,3,5-Trimethylbenzene			1.00	0.972		mg/Kg		97	73 - 120	2	30
1,3-Dichlorobenzene			1.00	0.995		mg/Kg		100	75 - 120	1	30
2-Hexanone			5.00	4.51		mg/Kg		90	54 - 140	6	30
Acetone			7.50	5.05		mg/Kg		67	41 - 150	15	30
Benzene			1.00	0.986		mg/Kg		99	80 - 120	1	30
1,1,1-Trichloroethane			1.00	1.08		mg/Kg		108	69 - 123	1	30
Bromomethane			1.00	1.06		mg/Kg		106	45 - 140	3	30
Carbon tetrachloride			1.00	1.21		mg/Kg		121	64 - 134	1	30
Chlorobenzene			1.00	1.01		mg/Kg		101	80 - 120	0	30
Bromochloromethane			1.00	0.973		mg/Kg		97	72 - 124	0	30
Chloroethane			1.00	0.810		mg/Kg		81	43 - 135	3	30
Chloroform			1.00	0.992		mg/Kg		99	80 - 120	1	30
Chloromethane			1.00	0.762		mg/Kg		76	56 - 120	3	30
Carbon disulfide			1.00	0.989		mg/Kg		99	64 - 133	2	30
cis-1,2-Dichloroethene			1.00	1.06		mg/Kg		106	80 - 125	1	30
Bromoform			1.00	1.29	*	mg/Kg		129	51 - 127	0	30
cis-1,3-Dichloropropene			1.00	1.13		mg/Kg		113	66 - 120	0	30
Bromodichloromethane			1.00	1.13		mg/Kg		113	70 - 120	0	30
Cyclohexane			1.00	0.939		mg/Kg		94	58 - 126	0	30
1,1-Dichloroethane			1.00	0.987		mg/Kg		99	79 - 120	1	30
1,1-Dichloroethene			1.00	1.02		mg/Kg		102	73 - 129	0	30
Dibromochloromethane			1.00	1.16		mg/Kg		116	69 - 125	0	30
Dichlorodifluoromethane			1.00	0.794		mg/Kg		79	21 - 127	0	30
1,2-Dichloropropane			1.00	1.01		mg/Kg		101	80 - 120	0	30
Ethylbenzene			1.00	0.983		mg/Kg		98	78 - 120	0	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-70130/6
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2-Butanone	7.50	5.47		mg/Kg		73	57 - 128	10	30
Freon 113	1.00	0.947		mg/Kg		95	64 - 135	0	30
1,1,2-Trichloroethane	1.00	1.05		mg/Kg		105	80 - 120	0	30
2-Nitropropane	1.00	2.39	*	mg/Kg		239	27 - 183	8	30
m&p-Xylene	2.00	2.02		mg/Kg		101	80 - 120	1	30
Methyl acetate	1.00	1.06		mg/Kg		106	67 - 128	4	30
1,1,2,2-Tetrachloroethane	1.00	0.972		mg/Kg		97	69 - 125	0	30
Methyl tertiary butyl ether	1.00	0.950		mg/Kg		95	72 - 120	1	30
1,2,3-Trichlorobenzene	1.00	0.835		mg/Kg		84	57 - 131	2	30
Methylcyclohexane	1.00	0.944		mg/Kg		94	61 - 124	0	30
Methylene Chloride	1.00	0.966		mg/Kg		97	76 - 122	4	30
1,2-Dichlorobenzene	1.00	0.970		mg/Kg		97	76 - 120	0	30
1,2-Dibromo-3-Chloropropane	1.00	0.825		mg/Kg		82	48 - 134	2	30
Isopropylbenzene	1.00	0.976		mg/Kg		98	77 - 120	1	30
o-Xylene	1.00	0.984		mg/Kg		98	75 - 120	0	30
Styrene	1.00	1.01		mg/Kg		101	76 - 120	0	30
Cyclohexanone	25.0	21.7		mg/Kg		87	47 - 136	9	30
Tetrachloroethene	1.00	1.03		mg/Kg		103	73 - 120	3	30
Isobutyl alcohol	25.0	26.1		mg/Kg		104	69 - 129	1	30
Naphthalene	1.00	0.795		mg/Kg		80	48 - 130	1	30
Toluene	1.00	0.993		mg/Kg		99	80 - 120	0	30
n-Butanol	50.0	49.2		mg/Kg		98	63 - 123	3	30
trans-1,2-Dichloroethene	1.00	0.999		mg/Kg		100	80 - 126	2	30
n-Butylbenzene	1.00	0.936		mg/Kg		94	71 - 121	1	30
trans-1,3-Dichloropropene	1.00	1.08		mg/Kg		108	68 - 122	1	30
n-Heptane	1.00	0.963		mg/Kg		96	50 - 141	0	30
Trichloroethene	1.00	0.997		mg/Kg		100	80 - 120	1	30
Trichlorofluoromethane	1.00	0.877		mg/Kg		88	55 - 134	1	30
p-Isopropyltoluene	1.00	0.978		mg/Kg		98	72 - 120	1	30
Vinyl chloride	1.00	0.820		mg/Kg		82	52 - 120	1	30
sec-Butylbenzene	1.00	0.978		mg/Kg		98	72 - 120	3	30
t-Butyl alcohol	10.0	10.0		mg/Kg		100	74 - 121	4	30
tert-Butylbenzene	1.00	1.02		mg/Kg		102	68 - 120	4	30
Tetrahydrofuran	5.00	4.05		mg/Kg		81	71 - 127	8	30
Xylenes, Total	3.00	3.00		mg/Kg		100	75 - 120	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*
4-Bromofluorobenzene (Surr)	*90*		*50 - 131*
Dibromofluoromethane (Surr)	*98*		*50 - 141*
Toluene-d8 (Surr)	*97*		*52 - 141*

Lab Sample ID: LCSD 410-70130/8
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetonitrile	7.50	7.72		mg/Kg		103	61 - 120	9	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-70130/8
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chlorodifluoromethane			1.00	0.911		mg/Kg		91	60 - 133	12	30
Ethyl acetate			1.00	0.955		mg/Kg		95	65 - 133	2	30
Ethyl ether			1.00	1.05		mg/Kg		105	59 - 135	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*54 - 135*
4-Bromofluorobenzene (Surr)	*92*		*50 - 131*
Dibromofluoromethane (Surr)	*94*		*50 - 141*
Toluene-d8 (Surr)	*96*		*52 - 141*

Lab Sample ID: MB 410-70702/10
Matrix: Water
Analysis Batch: 70702

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
1,2,4-Trimethylbenzene	ND		5.0	1.0	ug/L			11/28/20 12:21	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			11/28/20 12:21	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			11/28/20 12:21	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 12:21	1
1,4-Dioxane	ND		250	29	ug/L			11/28/20 12:21	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			11/28/20 12:21	1
1,3,5-Trimethylbenzene	ND		5.0	0.30	ug/L			11/28/20 12:21	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 12:21	1
2-Hexanone	ND		10	0.30	ug/L			11/28/20 12:21	1
Acetone	ND		20	0.70	ug/L			11/28/20 12:21	1
Benzene	ND		1.0	0.20	ug/L			11/28/20 12:21	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			11/28/20 12:21	1
Bromomethane	ND		1.0	0.30	ug/L			11/28/20 12:21	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Chlorobenzene	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Bromochloromethane	ND		5.0	0.20	ug/L			11/28/20 12:21	1
Chloroethane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Chloroform	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Chloromethane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Carbon disulfide	ND		5.0	0.20	ug/L			11/28/20 12:21	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Bromoform	ND		4.0	1.0	ug/L			11/28/20 12:21	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Bromodichloromethane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Cyclohexane	ND		5.0	1.0	ug/L			11/28/20 12:21	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Dibromochloromethane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Ethylbenzene	ND		1.0	0.40	ug/L			11/28/20 12:21	1
2-Butanone	ND		10	0.30	ug/L			11/28/20 12:21	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-70702/10
Matrix: Water
Analysis Batch: 70702

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Freon 113	ND		10	0.20	ug/L			11/28/20 12:21	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
2-Nitropropane	ND		10	0.80	ug/L			11/28/20 12:21	1
m&p-Xylene	ND		5.0	1.0	ug/L			11/28/20 12:21	1
Methyl acetate	ND		5.0	0.30	ug/L			11/28/20 12:21	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			11/28/20 12:21	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			11/28/20 12:21	1
Methylcyclohexane	ND		5.0	0.50	ug/L			11/28/20 12:21	1
Methylene Chloride	ND		1.0	0.30	ug/L			11/28/20 12:21	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 12:21	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			11/28/20 12:21	1
Acetonitrile	ND		100	16	ug/L			11/28/20 12:21	1
Isopropylbenzene	ND		5.0	0.20	ug/L			11/28/20 12:21	1
o-Xylene	ND		1.0	0.40	ug/L			11/28/20 12:21	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			11/28/20 12:21	1
Styrene	ND		5.0	0.20	ug/L			11/28/20 12:21	1
Cyclohexanone	ND		100	25	ug/L			11/28/20 12:21	1
Ethyl acetate	ND		5.0	0.70	ug/L			11/28/20 12:21	1
Ethyl ether	ND		5.0	0.20	ug/L			11/28/20 12:21	1
Tetrachloroethene	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Isobutyl alcohol	ND		250	36	ug/L			11/28/20 12:21	1
Naphthalene	ND		5.0	1.0	ug/L			11/28/20 12:21	1
Toluene	ND		1.0	0.20	ug/L			11/28/20 12:21	1
n-Butanol	ND		250	61	ug/L			11/28/20 12:21	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 12:21	1
n-Butylbenzene	ND		5.0	0.20	ug/L			11/28/20 12:21	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			11/28/20 12:21	1
n-Heptane	ND		5.0	2.0	ug/L			11/28/20 12:21	1
Trichloroethene	ND		1.0	0.20	ug/L			11/28/20 12:21	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			11/28/20 12:21	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			11/28/20 12:21	1
Vinyl chloride	ND		1.0	0.20	ug/L			11/28/20 12:21	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			11/28/20 12:21	1
t-Butyl alcohol	ND		50	12	ug/L			11/28/20 12:21	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			11/28/20 12:21	1
Tetrahydrofuran	ND		10	0.70	ug/L			11/28/20 12:21	1
Xylenes, Total	ND		6.0	1.4	ug/L			11/28/20 12:21	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*11/28/20 12:21*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 120*		*11/28/20 12:21*	*1*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*11/28/20 12:21*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*11/28/20 12:21*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*11/28/20 12:21*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-70702/5
Matrix: Water
Analysis Batch: 70702

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	20.0	21.8		ug/L		109	77 - 120
1,2,4-Trimethylbenzene	20.0	21.7		ug/L		108	75 - 120
1,2-Dichloroethane	20.0	20.8		ug/L		104	73 - 124
1,2,4-Trichlorobenzene	20.0	19.9		ug/L		100	63 - 120
1,4-Dichlorobenzene	20.0	22.0		ug/L		110	80 - 120
1,4-Dioxane	500	544		ug/L		109	63 - 146
4-Methyl-2-pentanone	100	107		ug/L		107	62 - 133
1,3,5-Trimethylbenzene	20.0	21.7		ug/L		108	75 - 120
1,3-Dichlorobenzene	20.0	22.1		ug/L		110	80 - 120
2-Hexanone	100	110		ug/L		110	56 - 135
Acetone	150	147		ug/L		98	54 - 157
Benzene	20.0	21.9		ug/L		109	80 - 120
1,1,1-Trichloroethane	20.0	22.1		ug/L		110	67 - 126
Bromomethane	20.0	25.8	*	ug/L		129	53 - 128
Carbon tetrachloride	20.0	23.6		ug/L		118	64 - 134
Chlorobenzene	20.0	22.4		ug/L		112	80 - 120
Bromochloromethane	20.0	21.3		ug/L		107	80 - 120
Chloroethane	20.0	25.1	*	ug/L		126	55 - 123
Chloroform	20.0	21.8		ug/L		109	80 - 120
Chloromethane	20.0	29.2	*	ug/L		146	56 - 121
Carbon disulfide	20.0	22.1		ug/L		111	65 - 128
cis-1,2-Dichloroethene	20.0	23.0		ug/L		115	80 - 125
Bromoform	20.0	20.9		ug/L		105	51 - 120
cis-1,3-Dichloropropene	20.0	21.1		ug/L		106	75 - 120
Bromodichloromethane	20.0	21.8		ug/L		109	71 - 120
Cyclohexane	20.0	20.1		ug/L		101	68 - 126
1,1-Dichloroethane	20.0	21.4		ug/L		107	80 - 120
1,1-Dichloroethene	20.0	22.9		ug/L		115	80 - 131
Dibromochloromethane	20.0	22.4		ug/L		112	71 - 120
Dichlorodifluoromethane	20.0	28.9	*	ug/L		145	41 - 127
1,2-Dichloropropane	20.0	21.2		ug/L		106	80 - 120
Ethylbenzene	20.0	22.2		ug/L		111	80 - 120
2-Butanone	150	161		ug/L		107	59 - 135
Freon 113	20.0	21.9		ug/L		109	73 - 139
1,1,2-Trichloroethane	20.0	22.1		ug/L		110	80 - 120
2-Nitropropane	20.0	19.3		ug/L		96	19 - 144
m&p-Xylene	40.0	46.2		ug/L		116	80 - 120
Methyl acetate	20.0	22.0		ug/L		110	54 - 136
1,1,2,2-Tetrachloroethane	20.0	20.6		ug/L		103	72 - 120
Methyl tertiary butyl ether	20.0	19.5		ug/L		98	69 - 122
1,2,3-Trichlorobenzene	20.0	19.8		ug/L		99	66 - 120
Methylcyclohexane	20.0	23.1		ug/L		115	67 - 121
Methylene Chloride	20.0	21.7		ug/L		109	80 - 120
1,2-Dichlorobenzene	20.0	21.6		ug/L		108	80 - 120
1,2-Dibromo-3-Chloropropane	20.0	20.5		ug/L		102	47 - 131
Isopropylbenzene	20.0	22.7		ug/L		114	80 - 120
o-Xylene	20.0	22.5		ug/L		112	80 - 120
Styrene	20.0	23.1		ug/L		115	80 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-70702/5
Matrix: Water
Analysis Batch: 70702

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyclohexanone	500	434		ug/L		87	27 - 141
Ethyl ether	20.0	20.5		ug/L		103	59 - 141
Tetrachloroethene	20.0	20.1		ug/L		100	80 - 120
Isobutyl alcohol	500	514		ug/L		103	61 - 136
Naphthalene	20.0	20.1		ug/L		101	53 - 124
Toluene	20.0	22.1		ug/L		111	80 - 120
n-Butanol	1000	1110		ug/L		111	57 - 130
trans-1,2-Dichloroethene	20.0	22.6		ug/L		113	80 - 126
n-Butylbenzene	20.0	21.0		ug/L		105	76 - 120
trans-1,3-Dichloropropene	20.0	20.9		ug/L		104	67 - 120
n-Heptane	20.0	22.2		ug/L		111	56 - 133
Trichloroethene	20.0	22.3		ug/L		111	80 - 120
Trichlorofluoromethane	20.0	26.9		ug/L		134	55 - 135
p-Isopropyltoluene	20.0	22.2		ug/L		111	76 - 120
Vinyl chloride	20.0	29.0	*	ug/L		145	56 - 120
sec-Butylbenzene	20.0	21.7		ug/L		109	77 - 120
t-Butyl alcohol	200	213		ug/L		107	60 - 130
tert-Butylbenzene	20.0	21.3		ug/L		106	78 - 120
Tetrahydrofuran	100	103		ug/L		103	54 - 144
Xylenes, Total	60.0	68.7		ug/L		115	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*
Dibromofluoromethane (Surr)	*100*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*

Lab Sample ID: LCS 410-70702/7
Matrix: Water
Analysis Batch: 70702

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetonitrile	150	140		ug/L		93	66 - 149
Chlorodifluoromethane	20.0	19.3		ug/L		97	45 - 149
Ethyl acetate	20.0	20.3		ug/L		101	67 - 131

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*
Dibromofluoromethane (Surr)	*99*		*80 - 120*
Toluene-d8 (Surr)	*97*		*80 - 120*

Lab Sample ID: LCSD 410-70702/6
Matrix: Water
Analysis Batch: 70702

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane	20.0	21.8		ug/L		109	77 - 120	0	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-70702/6
Matrix: Water
Analysis Batch: 70702

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,4-Trimethylbenzene	20.0	20.5		ug/L		102	75 - 120	6	30
1,2-Dichloroethane	20.0	20.4		ug/L		102	73 - 124	2	30
1,2,4-Trichlorobenzene	20.0	19.1		ug/L		96	63 - 120	4	30
1,4-Dichlorobenzene	20.0	21.4		ug/L		107	80 - 120	2	30
1,4-Dioxane	500	665		ug/L		133	63 - 146	20	30
4-Methyl-2-pentanone	100	106		ug/L		106	62 - 133	1	30
1,3,5-Trimethylbenzene	20.0	20.7		ug/L		104	75 - 120	5	30
1,3-Dichlorobenzene	20.0	21.2		ug/L		106	80 - 120	4	30
2-Hexanone	100	111		ug/L		111	56 - 135	1	30
Acetone	150	154		ug/L		103	54 - 157	5	30
Benzene	20.0	21.2		ug/L		106	80 - 120	3	30
1,1,1-Trichloroethane	20.0	21.4		ug/L		107	67 - 126	3	30
Bromomethane	20.0	26.3	*	ug/L		131	53 - 128	2	30
Carbon tetrachloride	20.0	22.5		ug/L		112	64 - 134	5	30
Chlorobenzene	20.0	22.1		ug/L		110	80 - 120	2	30
Bromochloromethane	20.0	20.8		ug/L		104	80 - 120	2	30
Chloroethane	20.0	25.8	*	ug/L		129	55 - 123	3	30
Chloroform	20.0	21.2		ug/L		106	80 - 120	3	30
Chloromethane	20.0	28.7	*	ug/L		143	56 - 121	2	30
Carbon disulfide	20.0	21.5		ug/L		107	65 - 128	3	30
cis-1,2-Dichloroethene	20.0	22.6		ug/L		113	80 - 125	2	30
Bromoform	20.0	20.7		ug/L		103	51 - 120	1	30
cis-1,3-Dichloropropene	20.0	20.9		ug/L		105	75 - 120	1	30
Bromodichloromethane	20.0	21.2		ug/L		106	71 - 120	2	30
Cyclohexane	20.0	20.0		ug/L		100	68 - 126	1	30
1,1-Dichloroethane	20.0	21.0		ug/L		105	80 - 120	2	30
1,1-Dichloroethene	20.0	22.5		ug/L		113	80 - 131	2	30
Dibromochloromethane	20.0	22.0		ug/L		110	71 - 120	2	30
Dichlorodifluoromethane	20.0	27.5	*	ug/L		137	41 - 127	5	30
1,2-Dichloropropane	20.0	21.0		ug/L		105	80 - 120	1	30
Ethylbenzene	20.0	21.9		ug/L		110	80 - 120	1	30
2-Butanone	150	160		ug/L		107	59 - 135	0	30
Freon 113	20.0	21.0		ug/L		105	73 - 139	4	30
1,1,2-Trichloroethane	20.0	21.8		ug/L		109	80 - 120	1	30
2-Nitropropane	20.0	20.0		ug/L		100	19 - 144	4	30
m&p-Xylene	40.0	45.6		ug/L		114	80 - 120	1	30
Methyl acetate	20.0	21.6		ug/L		108	54 - 136	2	30
1,1,2,2-Tetrachloroethane	20.0	19.8		ug/L		99	72 - 120	4	30
Methyl tertiary butyl ether	20.0	19.3		ug/L		96	69 - 122	1	30
1,2,3-Trichlorobenzene	20.0	18.9		ug/L		94	66 - 120	5	30
Methylcyclohexane	20.0	22.3		ug/L		111	67 - 121	3	30
Methylene Chloride	20.0	21.1		ug/L		106	80 - 120	3	30
1,2-Dichlorobenzene	20.0	20.8		ug/L		104	80 - 120	4	30
1,2-Dibromo-3-Chloropropane	20.0	19.3		ug/L		96	47 - 131	6	30
Isopropylbenzene	20.0	22.3		ug/L		111	80 - 120	2	30
o-Xylene	20.0	21.9		ug/L		110	80 - 120	3	30
Styrene	20.0	22.5		ug/L		113	80 - 120	3	30
Cyclohexanone	500	445		ug/L		89	27 - 141	3	30
Ethyl ether	20.0	22.8		ug/L		114	59 - 141	11	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-70702/6
Matrix: Water
Analysis Batch: 70702

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Tetrachloroethene			20.0	19.8		ug/L		99	80 - 120	1	30
Isobutyl alcohol			500	539		ug/L		108	61 - 136	5	30
Naphthalene			20.0	19.5		ug/L		98	53 - 124	3	30
Toluene			20.0	21.8		ug/L		109	80 - 120	2	30
n-Butanol			1000	1150		ug/L		115	57 - 130	4	30
trans-1,2-Dichloroethene			20.0	21.8		ug/L		109	80 - 126	3	30
n-Butylbenzene			20.0	20.2		ug/L		101	76 - 120	4	30
trans-1,3-Dichloropropene			20.0	20.8		ug/L		104	67 - 120	0	30
n-Heptane			20.0	21.1		ug/L		106	56 - 133	5	30
Trichloroethene			20.0	21.7		ug/L		109	80 - 120	3	30
Trichlorofluoromethane			20.0	26.0		ug/L		130	55 - 135	3	30
p-Isopropyltoluene			20.0	21.2		ug/L		106	76 - 120	4	30
Vinyl chloride			20.0	28.8	*	ug/L		144	56 - 120	0	30
sec-Butylbenzene			20.0	20.8		ug/L		104	77 - 120	4	30
t-Butyl alcohol			200	216		ug/L		108	60 - 130	1	30
tert-Butylbenzene			20.0	22.1		ug/L		111	78 - 120	4	30
Tetrahydrofuran			100	105		ug/L		105	54 - 144	1	30
Xylenes, Total			60.0	67.5		ug/L		113	80 - 120	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 120*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*
Dibromofluoromethane (Surr)	*100*		*80 - 120*
Toluene-d8 (Surr)	*99*		*80 - 120*

Lab Sample ID: LCSD 410-70702/8
Matrix: Water
Analysis Batch: 70702

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetonitrile			150	130		ug/L		87	66 - 149	7	30
Chlorodifluoromethane			20.0	18.5		ug/L		92	45 - 149	4	30
Ethyl acetate			20.0	18.4		ug/L		92	67 - 131	10	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*
Dibromofluoromethane (Surr)	*100*		*80 - 120*
Toluene-d8 (Surr)	*96*		*80 - 120*

Lab Sample ID: 410-21255-1 MS
Matrix: Groundwater
Analysis Batch: 70702

Client Sample ID: B55-PDI-SB-21
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	ND		20.0	20.9		ug/L		104	77 - 120
1,2,4-Trimethylbenzene	ND		20.0	20.9		ug/L		104	75 - 120
1,2-Dichloroethane	ND		20.0	20.6		ug/L		103	73 - 124

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 410-21255-1 MS
Matrix: Groundwater
Analysis Batch: 70702

Client Sample ID: B55-PDI-SB-21
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,4-Trichlorobenzene	ND		20.0	17.7		ug/L		89	63 - 120
1,4-Dichlorobenzene	ND		20.0	21.0		ug/L		105	80 - 120
1,4-Dioxane	ND	F2	500	547		ug/L		109	63 - 146
4-Methyl-2-pentanone	ND		100	102		ug/L		102	62 - 133
1,3,5-Trimethylbenzene	ND		20.0	20.9		ug/L		104	75 - 120
1,3-Dichlorobenzene	ND		20.0	21.3		ug/L		107	80 - 120
2-Hexanone	ND		100	107		ug/L		107	56 - 135
Acetone	1.3	J	150	145		ug/L		96	54 - 157
Benzene	ND		20.0	21.6		ug/L		108	80 - 120
1,1,1-Trichloroethane	ND		20.0	22.0		ug/L		110	67 - 126
Bromomethane	ND	F1 *	20.0	24.7		ug/L		123	53 - 128
Carbon tetrachloride	ND		20.0	23.8		ug/L		119	64 - 134
Chlorobenzene	ND		20.0	22.0		ug/L		110	80 - 120
Bromochloromethane	ND		20.0	20.6		ug/L		103	80 - 120
Chloroethane	ND	F1 *	20.0	24.3		ug/L		121	55 - 123
Chloroform	ND		20.0	21.8		ug/L		109	80 - 120
Chloromethane	ND	F1 *	20.0	25.9	F1	ug/L		130	56 - 121
Carbon disulfide	ND		20.0	21.4		ug/L		107	65 - 128
cis-1,2-Dichloroethene	ND		20.0	22.9		ug/L		114	80 - 125
Bromoform	ND		20.0	19.6		ug/L		98	51 - 120
cis-1,3-Dichloropropene	ND		20.0	19.9		ug/L		100	75 - 120
Bromodichloromethane	ND		20.0	21.1		ug/L		105	71 - 120
Cyclohexane	ND	F2	20.0	19.9		ug/L		99	68 - 126
1,1-Dichloroethane	ND		20.0	21.2		ug/L		106	80 - 120
1,1-Dichloroethene	ND		20.0	22.9		ug/L		115	80 - 131
Dibromochloromethane	ND		20.0	21.7		ug/L		108	71 - 120
Dichlorodifluoromethane	ND	*	20.0	24.9		ug/L		125	41 - 127
1,2-Dichloropropane	ND		20.0	20.6		ug/L		103	80 - 120
Ethylbenzene	ND		20.0	21.9		ug/L		109	80 - 120
2-Butanone	ND		150	153		ug/L		102	59 - 135
Freon 113	ND	F2	20.0	21.9		ug/L		109	73 - 139
1,1,2-Trichloroethane	ND		20.0	20.8		ug/L		104	80 - 120
2-Nitropropane	ND		20.0	18.4		ug/L		92	19 - 144
m&p-Xylene	ND		40.0	45.7		ug/L		114	80 - 120
Methyl acetate	ND		20.0	19.5		ug/L		98	54 - 136
1,1,2,2-Tetrachloroethane	ND		20.0	20.0		ug/L		100	72 - 120
Methyl tertiary butyl ether	ND		20.0	18.4		ug/L		92	69 - 122
1,2,3-Trichlorobenzene	ND		20.0	17.7		ug/L		89	66 - 120
Methylcyclohexane	ND		20.0	22.3		ug/L		112	67 - 121
Methylene Chloride	ND		20.0	20.7		ug/L		104	80 - 120
1,2-Dichlorobenzene	ND		20.0	20.6		ug/L		103	80 - 120
1,2-Dibromo-3-Chloropropane	ND		20.0	19.0		ug/L		95	47 - 131
Isopropylbenzene	ND		20.0	22.0		ug/L		110	80 - 120
o-Xylene	ND		20.0	21.8		ug/L		109	80 - 120
Styrene	ND		20.0	22.4		ug/L		112	80 - 120
Cyclohexanone	ND		500	395		ug/L		79	27 - 141
Ethyl ether	ND		20.0	22.9		ug/L		114	59 - 141
Tetrachloroethene	ND	F1	20.0	20.0		ug/L		100	80 - 120
Isobutyl alcohol	ND		500	522		ug/L		104	61 - 136

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 410-21255-1 MS
Matrix: Groundwater
Analysis Batch: 70702

Client Sample ID: B55-PDI-SB-21
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	ND		20.0	18.9		ug/L		94	53 - 124
Toluene	ND		20.0	21.6		ug/L		108	80 - 120
n-Butanol	ND		1000	1030		ug/L		103	57 - 130
trans-1,2-Dichloroethene	ND		20.0	22.2		ug/L		111	80 - 126
n-Butylbenzene	ND		20.0	19.7		ug/L		99	76 - 120
trans-1,3-Dichloropropene	ND		20.0	19.7		ug/L		99	67 - 120
n-Heptane	ND	F2	20.0	20.7		ug/L		104	56 - 133
Trichloroethene	ND		20.0	22.3		ug/L		112	80 - 120
Trichlorofluoromethane	ND	F1	20.0	27.8	F1	ug/L		139	55 - 135
p-Isopropyltoluene	ND		20.0	21.4		ug/L		107	76 - 120
Vinyl chloride	ND	F1 *	20.0	27.8	F1	ug/L		139	56 - 120
sec-Butylbenzene	ND		20.0	20.9		ug/L		105	77 - 120
t-Butyl alcohol	ND		200	197		ug/L		99	60 - 130
tert-Butylbenzene	ND		20.0	20.8		ug/L		104	78 - 120
Tetrahydrofuran	ND		100	99.5		ug/L		100	54 - 144
Xylenes, Total	ND		60.0	67.5		ug/L		113	80 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*

Lab Sample ID: 410-21255-1 MSD
Matrix: Groundwater
Analysis Batch: 70702

Client Sample ID: B55-PDI-SB-21
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane	ND		20.0	16.3		ug/L		82	77 - 120	24	30
1,2,4-Trimethylbenzene	ND		20.0	16.3		ug/L		81	75 - 120	25	30
1,2-Dichloroethane	ND		20.0	16.0		ug/L		80	73 - 124	25	30
1,2,4-Trichlorobenzene	ND		20.0	13.9		ug/L		70	63 - 120	24	30
1,4-Dichlorobenzene	ND		20.0	16.6		ug/L		83	80 - 120	23	30
1,4-Dioxane	ND	F2	500	385	F2	ug/L		77	63 - 146	35	30
4-Methyl-2-pentanone	ND		100	81.2		ug/L		81	62 - 133	23	30
1,3,5-Trimethylbenzene	ND		20.0	16.2		ug/L		81	75 - 120	25	30
1,3-Dichlorobenzene	ND		20.0	16.7		ug/L		84	80 - 120	24	30
2-Hexanone	ND		100	84.9		ug/L		85	56 - 135	23	30
Acetone	1.3	J	150	114		ug/L		75	54 - 157	24	30
Benzene	ND		20.0	16.9		ug/L		84	80 - 120	25	30
1,1,1-Trichloroethane	ND		20.0	17.4		ug/L		87	67 - 126	23	30
Bromomethane	ND	F1 *	20.0	26.9	F1	ug/L		134	53 - 128	9	30
Carbon tetrachloride	ND		20.0	18.1		ug/L		91	64 - 134	27	30
Chlorobenzene	ND		20.0	17.1		ug/L		86	80 - 120	25	30
Bromochloromethane	ND		20.0	21.0		ug/L		105	80 - 120	2	30
Chloroethane	ND	F1 *	20.0	26.0	F1	ug/L		130	55 - 123	7	30
Chloroform	ND		20.0	17.2		ug/L		86	80 - 120	24	30
Chloromethane	ND	F1 *	20.0	27.7	F1	ug/L		138	56 - 121	7	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 410-21255-1 MSD
Matrix: Groundwater
Analysis Batch: 70702

Client Sample ID: B55-PDI-SB-21
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon disulfide	ND		20.0	16.9		ug/L		85	65 - 128	23	30
cis-1,2-Dichloroethene	ND		20.0	17.9		ug/L		89	80 - 125	25	30
Bromoform	ND		20.0	15.2		ug/L		76	51 - 120	25	30
cis-1,3-Dichloropropene	ND		20.0	15.2		ug/L		76	75 - 120	27	30
Bromodichloromethane	ND		20.0	16.5		ug/L		83	71 - 120	24	30
Cyclohexane	ND	F2	20.0	14.6	F2	ug/L		73	68 - 126	31	30
1,1-Dichloroethane	ND		20.0	16.5		ug/L		82	80 - 120	25	30
1,1-Dichloroethene	ND		20.0	17.8		ug/L		89	80 - 131	25	30
Dibromochloromethane	ND		20.0	16.4		ug/L		82	71 - 120	28	30
Dichlorodifluoromethane	ND	*	20.0	23.2		ug/L		116	41 - 127	7	30
1,2-Dichloropropane	ND		20.0	16.4		ug/L		82	80 - 120	23	30
Ethylbenzene	ND		20.0	17.0		ug/L		85	80 - 120	25	30
2-Butanone	ND		150	121		ug/L		81	59 - 135	23	30
Freon 113	ND	F2	20.0	15.9	F2	ug/L		80	73 - 139	31	30
1,1,2-Trichloroethane	ND		20.0	16.4		ug/L		82	80 - 120	24	30
2-Nitropropane	ND		20.0	13.6		ug/L		68	19 - 144	30	30
m&p-Xylene	ND		40.0	35.7		ug/L		89	80 - 120	25	30
Methyl acetate	ND		20.0	21.2		ug/L		106	54 - 136	8	30
1,1,2,2-Tetrachloroethane	ND		20.0	15.5		ug/L		78	72 - 120	26	30
Methyl tertiary butyl ether	ND		20.0	14.3		ug/L		72	69 - 122	25	30
1,2,3-Trichlorobenzene	ND		20.0	14.1		ug/L		71	66 - 120	23	30
Methylcyclohexane	ND		20.0	20.4		ug/L		102	67 - 121	9	30
Methylene Chloride	ND		20.0	16.7		ug/L		84	80 - 120	21	30
1,2-Dichlorobenzene	ND		20.0	16.3		ug/L		82	80 - 120	23	30
1,2-Dibromo-3-Chloropropane	ND		20.0	15.2		ug/L		76	47 - 131	22	30
Isopropylbenzene	ND		20.0	16.8		ug/L		84	80 - 120	27	30
o-Xylene	ND		20.0	17.0		ug/L		85	80 - 120	25	30
Styrene	ND		20.0	17.4		ug/L		87	80 - 120	25	30
Cyclohexanone	ND		500	412		ug/L		82	27 - 141	4	30
Ethyl ether	ND		20.0	20.8		ug/L		104	59 - 141	10	30
Tetrachloroethene	ND	F1	20.0	15.4	F1	ug/L		77	80 - 120	26	30
Isobutyl alcohol	ND		500	398		ug/L		80	61 - 136	27	30
Naphthalene	ND		20.0	14.9		ug/L		75	53 - 124	23	30
Toluene	ND		20.0	17.1		ug/L		85	80 - 120	23	30
n-Butanol	ND		1000	815		ug/L		81	57 - 130	23	30
trans-1,2-Dichloroethene	ND		20.0	17.6		ug/L		88	80 - 126	23	30
n-Butylbenzene	ND		20.0	15.8		ug/L		79	76 - 120	22	30
trans-1,3-Dichloropropene	ND		20.0	15.0		ug/L		75	67 - 120	27	30
n-Heptane	ND	F2	20.0	13.4	F2	ug/L		67	56 - 133	43	30
Trichloroethene	ND		20.0	17.4		ug/L		87	80 - 120	25	30
Trichlorofluoromethane	ND	F1	20.0	26.8		ug/L		134	55 - 135	3	30
p-Isopropyltoluene	ND		20.0	16.6		ug/L		83	76 - 120	25	30
Vinyl chloride	ND	F1 *	20.0	29.2	F1	ug/L		146	56 - 120	5	30
sec-Butylbenzene	ND		20.0	16.3		ug/L		82	77 - 120	25	30
t-Butyl alcohol	ND		200	159		ug/L		79	60 - 130	22	30
tert-Butylbenzene	ND		20.0	16.0		ug/L		80	78 - 120	26	30
Tetrahydrofuran	ND		100	76.7		ug/L		77	54 - 144	26	30
Xylenes, Total	ND		60.0	52.7		ug/L		88	80 - 120	25	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 410-21255-1 MSD
Matrix: Groundwater
Analysis Batch: 70702

Client Sample ID: B55-PDI-SB-21
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 410-69548/1-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 69548

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
1,2,4,5-Tetrachlorobenzene	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
2,2'-oxybis[1-chloropropane]	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
2,3,4,6-Tetrachlorophenol	ND		10	4.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
2,4,5-Trichlorophenol	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
2,4,6-Trichlorophenol	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
2,4-Dichlorophenol	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
2,4-Dimethylphenol	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
2,4-Dinitrophenol	ND		30	14	ug/L		11/23/20 17:15	12/02/20 12:30	1
2,4-Dinitrotoluene	ND		5.0	1.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
2,6-Dinitrotoluene	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
2-Chloronaphthalene	ND		1.0	0.40	ug/L		11/23/20 17:15	12/02/20 12:30	1
2-Chlorophenol	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
2-Methylnaphthalene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
2-Methylphenol	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
2-Nitroaniline	ND		5.0	2.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
2-Nitrophenol	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
3,3'-Dichlorobenzidine	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
3-Nitroaniline	ND		7.0	3.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
4,6-Dinitro-2-methylphenol	ND		21	8.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
4-Bromophenyl-phenylether	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
4-Chloro-3-methylphenol	ND		3.5	1.6	ug/L		11/23/20 17:15	12/02/20 12:30	1
3,4-Methylphenol	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
4-Nitroaniline	ND		3.0	0.90	ug/L		11/23/20 17:15	12/02/20 12:30	1
4-Nitrophenol	ND		30	10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Acenaphthene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Acenaphthylene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Acetophenone	ND		10	4.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Anthracene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Atrazine	ND		5.0	2.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Benzaldehyde	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Benzo[a]anthracene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Benzo[a]pyrene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Benzo[b]fluoranthene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Benzo[g,h,i]perylene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Benzo[k]fluoranthene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Butylbenzylphthalate	ND		5.0	2.0	ug/L		11/23/20 17:15	12/02/20 12:30	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-69548/1-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 69548

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Caprolactam	ND		11	5.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Carbazole	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
Chrysene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Di-n-butyl phthalate	ND		5.0	2.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Di-n-octyl phthalate	ND		11	5.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Dibenz(a,h)anthracene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Dibenzofuran	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
Diethyl phthalate	ND		5.0	2.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
4-Chloroaniline	ND		10	4.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Dimethyl phthalate	ND		5.0	2.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Fluoranthene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
4-Chlorophenyl-phenyl ether	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
Fluorene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Hexachlorobenzene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Hexachlorobutadiene	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
Hexachlorocyclopentadiene	ND		11	5.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Hexachloroethane	ND		5.0	1.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Indeno[1,2,3-cd]pyrene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Isophorone	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
N-Nitrosodi-n-propylamine	ND		3.0	0.70	ug/L		11/23/20 17:15	12/02/20 12:30	1
N-Nitrosodiphenylamine	ND		3.0	0.70	ug/L		11/23/20 17:15	12/02/20 12:30	1
Naphthalene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Nitrobenzene	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
Aniline	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Phenanthrene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Phenol	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
Pentachlorophenol	ND		5.0	1.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Pyrene	ND		0.50	0.10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Bis(2-chloroethoxy)methane	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
Bis(2-chloroethyl)ether	ND		2.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
Bis(2-ethylhexyl) phthalate	ND		11	5.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Benzyl alcohol	ND		30	10	ug/L		11/23/20 17:15	12/02/20 12:30	1
Dicyclohexylamine	ND		20	10	ug/L		11/23/20 17:15	12/02/20 12:30	1
n,n'-Dimethylaniline	ND		1.0	0.50	ug/L		11/23/20 17:15	12/02/20 12:30	1
Pyridine	ND		5.0	2.0	ug/L		11/23/20 17:15	12/02/20 12:30	1
Triethylamine	ND		10	10	ug/L		11/23/20 17:15	12/02/20 12:30	1
1,4-Dioxane	ND		5.0	2.0	ug/L		11/23/20 17:15	12/02/20 12:30	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*11/23/20 17:15*	*12/02/20 12:30*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*74*		*10 - 150*	*11/23/20 17:15*	*12/02/20 12:30*	*1*
2-Fluorobiphenyl (Surr)	*60*		*44 - 102*	*11/23/20 17:15*	*12/02/20 12:30*	*1*
2-Fluorophenol (Surr)	*30*		*10 - 84*	*11/23/20 17:15*	*12/02/20 12:30*	*1*
Nitrobenzene-d5 (Surr)	*69*		*23 - 128*	*11/23/20 17:15*	*12/02/20 12:30*	*1*
p-Terphenyl-d14 (Surr)	*89*		*31 - 113*	*11/23/20 17:15*	*12/02/20 12:30*	*1*
Phenol-d5 (Surr)	*23*		*10 - 67*	*11/23/20 17:15*	*12/02/20 12:30*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LCS 410-69548/2-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 69548

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	50.0	35.8		ug/L		72	50 - 110
1,2,4,5-Tetrachlorobenzene	50.0	31.2		ug/L		62	32 - 113
2,2'-oxybis[1-chloropropane]	50.0	37.5		ug/L		75	41 - 118
2,3,4,6-Tetrachlorophenol	50.0	40.1		ug/L		80	64 - 130
2,4,5-Trichlorophenol	50.0	41.5		ug/L		83	59 - 126
2,4,6-Trichlorophenol	50.0	40.9		ug/L		82	59 - 129
2,4-Dichlorophenol	50.0	38.4		ug/L		77	51 - 123
2,4-Dimethylphenol	50.0	39.5		ug/L		79	43 - 102
2,4-Dinitrophenol	100	65.8		ug/L		66	30 - 143
2,4-Dinitrotoluene	50.0	42.8		ug/L		86	52 - 128
2,6-Dinitrotoluene	50.0	46.5		ug/L		93	61 - 121
2-Chloronaphthalene	50.0	35.3		ug/L		71	43 - 110
2-Chlorophenol	50.0	33.7		ug/L		67	46 - 109
2-Methylnaphthalene	50.0	35.7		ug/L		71	45 - 108
2-Methylphenol	50.0	33.1		ug/L		66	41 - 113
2-Nitroaniline	50.0	48.0		ug/L		96	60 - 123
2-Nitrophenol	50.0	37.8		ug/L		76	53 - 123
3,3'-Dichlorobenzidine	100	79.2		ug/L		79	42 - 107
3-Nitroaniline	50.0	38.0		ug/L		76	54 - 112
4,6-Dinitro-2-methylphenol	100	79.0		ug/L		79	49 - 138
4-Bromophenyl-phenylether	50.0	42.8		ug/L		86	54 - 121
4-Chloro-3-methylphenol	50.0	38.5		ug/L		77	52 - 126
3,4-Methylphenol	50.0	29.5		ug/L		59	41 - 109
4-Nitroaniline	50.0	40.6		ug/L		81	49 - 107
4-Nitrophenol	100	37.9		ug/L		38	23 - 89
Acenaphthene	50.0	39.1		ug/L		78	52 - 114
Acenaphthylene	50.0	47.4		ug/L		95	55 - 117
Acetophenone	50.0	39.1		ug/L		78	51 - 119
Anthracene	50.0	45.3		ug/L		91	61 - 117
Atrazine	50.4	44.1		ug/L		87	71 - 133
Benzaldehyde	50.5	32.7		ug/L		65	39 - 119
Benzo[a]anthracene	50.0	48.1		ug/L		96	61 - 126
Benzo[a]pyrene	50.0	43.9		ug/L		88	60 - 116
Benzo[b]fluoranthene	50.0	43.5		ug/L		87	61 - 119
Benzo[g,h,i]perylene	50.0	47.7		ug/L		95	54 - 120
Benzo[k]fluoranthene	50.0	48.8		ug/L		98	69 - 122
Butylbenzylphthalate	50.0	20.1		ug/L		40	11 - 125
Caprolactam	50.5	10.5	J	ug/L		21	12 - 40
Carbazole	50.0	45.6		ug/L		91	64 - 127
Chrysene	50.0	46.6		ug/L		93	65 - 121
Di-n-butyl phthalate	50.0	36.2		ug/L		72	43 - 118
Di-n-octyl phthalate	50.0	43.0		ug/L		86	48 - 129
Dibenz(a,h)anthracene	50.0	46.5		ug/L		93	57 - 124
Dibenzofuran	50.0	41.1		ug/L		82	60 - 112
Diethyl phthalate	50.0	29.6		ug/L		59	19 - 121
4-Chloroaniline	50.0	34.6		ug/L		69	45 - 93
Dimethyl phthalate	50.0	14.3		ug/L		29	10 - 134
Fluoranthene	50.0	45.1		ug/L		90	63 - 122

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-69548/2-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 69548

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorophenyl-phenyl ether	50.0	39.3		ug/L		79	47 - 121
Fluorene	50.0	42.5		ug/L		85	56 - 115
Hexachlorobenzene	50.0	41.6		ug/L		83	55 - 123
Hexachlorobutadiene	50.0	26.1		ug/L		52	20 - 108
Hexachlorocyclopentadiene	50.0	15.6		ug/L		31	10 - 42
Hexachloroethane	50.0	22.0		ug/L		44	22 - 88
Indeno[1,2,3-cd]pyrene	50.0	46.7		ug/L		93	52 - 121
Isophorone	50.0	45.9		ug/L		92	55 - 122
N-Nitrosodi-n-propylamine	50.0	41.8		ug/L		84	52 - 123
N-Nitrosodiphenylamine	42.5	38.7		ug/L		91	60 - 126
Naphthalene	50.0	34.1		ug/L		68	51 - 102
Nitrobenzene	50.0	40.3		ug/L		81	52 - 119
Aniline	50.0	26.7		ug/L		53	26 - 75
Phenanthrene	50.0	43.5		ug/L		87	65 - 113
Phenol	50.0	18.9		ug/L		38	22 - 69
Pentachlorophenol	100	77.7		ug/L		78	54 - 131
Pyrene	50.0	44.6		ug/L		89	65 - 115
Bis(2-chloroethoxy)methane	50.0	41.1		ug/L		82	51 - 120
Bis(2-chloroethyl)ether	50.0	39.7		ug/L		79	50 - 110
Bis(2-ethylhexyl) phthalate	50.0	44.3		ug/L		89	50 - 127
Benzyl alcohol	50.0	41.4		ug/L		83	56 - 115
Pyridine	100	34.8		ug/L		35	23 - 64
1,4-Dioxane	50.0	17.9		ug/L		36	21 - 64

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*75*		*10 - 150*
2-Fluorobiphenyl (Surr)	*58*		*44 - 102*
2-Fluorophenol (Surr)	*41*		*10 - 84*
Nitrobenzene-d5 (Surr)	*74*		*23 - 128*
p-Terphenyl-d14 (Surr)	*85*		*31 - 113*
Phenol-d5 (Surr)	*33*		*10 - 67*

Lab Sample ID: LCS 410-69548/5-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 69548

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dicyclohexylamine	50.1	ND	*-	ug/L		2	28 - 140
n,n'-Dimethylaniline	25.2	16.1		ug/L		64	59 - 114
Triethylamine	50.2	ND	*-	ug/L		6	10 - 88

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*75*		*10 - 150*
2-Fluorobiphenyl (Surr)	*51*		*44 - 102*
2-Fluorophenol (Surr)	*32*		*10 - 84*
Nitrobenzene-d5 (Surr)	*66*		*23 - 128*
p-Terphenyl-d14 (Surr)	*89*		*31 - 113*
Phenol-d5 (Surr)	*25*		*10 - 67*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LCSD 410-69548/6-A
Matrix: Water
Analysis Batch: 71928

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 69548

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dicyclohexylamine			50.1	ND	*-	ug/L		2	28 - 140	0	30
n,n'-Dimethylaniline			25.2	19.0		ug/L		75	59 - 114	16	30
Triethylamine			50.2	ND	*-	ug/L		6	10 - 88	0	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*73*		*10 - 150*
2-Fluorobiphenyl (Surr)	*52*		*44 - 102*
2-Fluorophenol (Surr)	*36*		*10 - 84*
Nitrobenzene-d5 (Surr)	*74*		*23 - 128*
p-Terphenyl-d14 (Surr)	*89*		*31 - 113*
Phenol-d5 (Surr)	*28*		*10 - 67*

Lab Sample ID: MB 410-70093/1-A
Matrix: Solid
Analysis Batch: 70671

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70093

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.037	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
1,2,4,5-Tetrachlorobenzene	ND		0.037	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2,2'-oxybis[1-chloropropane]	ND		0.043	0.020	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2,3,4,6-Tetrachlorophenol	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2,4,5-Trichlorophenol	ND		0.067	0.030	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2,4,6-Trichlorophenol	ND		0.057	0.027	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2,4-Dichlorophenol	ND		0.043	0.020	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2,4-Dimethylphenol	ND		0.067	0.030	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2,4-Dinitrophenol	ND		1.0	0.33	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2,4-Dinitrotoluene	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2,6-Dinitrotoluene	ND		0.050	0.023	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2-Chloronaphthalene	ND		0.033	0.0067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2-Chlorophenol	ND		0.037	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2-Methylnaphthalene	ND		0.033	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2-Methylphenol	ND		0.067	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2-Nitroaniline	ND		0.050	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
2-Nitrophenol	ND		0.057	0.027	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
3,3'-Dichlorobenzidine	ND		0.33	0.10	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
3-Nitroaniline	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
4,6-Dinitro-2-methylphenol	ND		0.50	0.23	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
4-Bromophenyl-phenylether	ND		0.050	0.023	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
4-Chloro-3-methylphenol	ND		0.050	0.023	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
3,4-Methylphenol	ND		0.050	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
4-Nitroaniline	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
4-Nitrophenol	ND		0.50	0.17	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Acenaphthene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Acenaphthylene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Acetophenone	ND		0.050	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Anthracene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Atrazine	ND		0.43	0.20	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Benzaldehyde	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-70093/1-A
Matrix: Solid
Analysis Batch: 70671

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70093

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	ND		0.017	0.0067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Benzo[a]pyrene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Benzo[b]fluoranthene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Benzo[g,h,i]perylene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Benzo[k]fluoranthene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Butylbenzylphthalate	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Caprolactam	ND		0.17	0.033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Carbazole	ND		0.037	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Chrysene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Di-n-butyl phthalate	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Di-n-octyl phthalate	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Dibenz(a,h)anthracene	ND		0.017	0.0067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Dibenzofuran	ND		0.037	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Diethyl phthalate	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
4-Chloroaniline	ND		0.17	0.033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Dimethyl phthalate	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Fluoranthene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
4-Chlorophenyl-phenyl ether	ND		0.043	0.020	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Fluorene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Hexachlorobenzene	ND		0.017	0.0067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Hexachlorobutadiene	ND		0.077	0.037	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Hexachlorocyclopentadiene	ND		0.50	0.20	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Hexachloroethane	ND		0.17	0.033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Indeno[1,2,3-cd]pyrene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Isophorone	ND		0.037	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
N-Nitrosodi-n-propylamine	ND		0.050	0.023	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
N-Nitrosodiphenylamine	ND		0.037	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Naphthalene	ND		0.017	0.0067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Nitrobenzene	ND		0.067	0.027	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Aniline	ND		0.50	0.17	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Phenanthrene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Phenol	ND		0.037	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Pentachlorophenol	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Pyrene	ND		0.017	0.0033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Bis(2-chloroethoxy)methane	ND		0.037	0.017	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Bis(2-chloroethyl)ether	ND		0.050	0.023	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Bis(2-ethylhexyl) phthalate	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Benzyl alcohol	ND		0.50	0.17	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Dicyclohexylamine	ND		2.0	0.67	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
n,n'-Dimethylaniline	ND		0.17	0.033	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Pyridine	ND		0.17	0.067	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
Triethylamine	ND		5.0	1.7	mg/Kg		11/24/20 16:26	11/26/20 10:27	1
1,4-Dioxane	ND		0.33	0.10	mg/Kg		11/24/20 16:26	11/26/20 10:27	1

Tentatively Identified Compound	*Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.309*	*T J*	*mg/Kg*		*3.86*		*11/24/20 16:26*	*11/26/20 10:27*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-70093/1-A
Matrix: Solid
Analysis Batch: 70671

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70093

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	84		13 - 121	11/24/20 16:26	11/26/20 10:27	1
2-Fluorobiphenyl (Surr)	82		39 - 100	11/24/20 16:26	11/26/20 10:27	1
2-Fluorophenol (Surr)	77		26 - 96	11/24/20 16:26	11/26/20 10:27	1
Nitrobenzene-d5 (Surr)	69		32 - 97	11/24/20 16:26	11/26/20 10:27	1
p-Terphenyl-d14 (Surr)	107		45 - 108	11/24/20 16:26	11/26/20 10:27	1
Phenol-d5 (Surr)	78		27 - 104	11/24/20 16:26	11/26/20 10:27	1

Lab Sample ID: LCS 410-70093/2-A
Matrix: Solid
Analysis Batch: 70185

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 70093

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	1.67	1.35		mg/Kg		81	59 - 106
1,2,4,5-Tetrachlorobenzene	1.67	1.36		mg/Kg		82	60 - 102
2,2'-oxybis[1-chloropropane]	1.67	1.26		mg/Kg		76	44 - 105
2,3,4,6-Tetrachlorophenol	1.67	1.56		mg/Kg		94	66 - 116
2,4,5-Trichlorophenol	1.67	1.48		mg/Kg		89	67 - 110
2,4,6-Trichlorophenol	1.67	1.55		mg/Kg		93	60 - 120
2,4-Dichlorophenol	1.67	1.43		mg/Kg		86	64 - 109
2,4-Dimethylphenol	1.67	1.44		mg/Kg		86	46 - 88
2,4-Dinitrophenol	3.33	3.00		mg/Kg		90	47 - 126
2,4-Dinitrotoluene	1.67	1.54		mg/Kg		92	67 - 115
2,6-Dinitrotoluene	1.67	1.56		mg/Kg		93	67 - 113
2-Chloronaphthalene	1.67	1.39		mg/Kg		84	56 - 112
2-Chlorophenol	1.67	1.41		mg/Kg		84	59 - 97
2-Methylnaphthalene	1.67	1.43		mg/Kg		86	63 - 101
2-Methylphenol	1.67	1.53		mg/Kg		92	56 - 105
2-Nitroaniline	1.67	1.40		mg/Kg		84	63 - 119
2-Nitrophenol	1.67	1.33		mg/Kg		80	55 - 104
3,3'-Dichlorobenzidine	3.33	2.27		mg/Kg		68	40 - 107
3-Nitroaniline	1.67	1.24		mg/Kg		74	59 - 124
4,6-Dinitro-2-methylphenol	3.33	2.86		mg/Kg		86	63 - 126
4-Bromophenyl-phenylether	1.67	1.45		mg/Kg		87	68 - 114
4-Chloro-3-methylphenol	1.67	1.49		mg/Kg		89	62 - 117
3,4-Methylphenol	1.67	1.39		mg/Kg		84	56 - 100
4-Nitroaniline	1.67	1.55		mg/Kg		93	45 - 99
4-Nitrophenol	3.33	2.89		mg/Kg		87	52 - 114
Acenaphthene	1.67	1.41		mg/Kg		85	61 - 104
Acenaphthylene	1.67	1.76		mg/Kg		105	59 - 116
Acetophenone	1.67	1.27		mg/Kg		76	54 - 95
Anthracene	1.67	1.60		mg/Kg		96	75 - 114
Atrazine	1.68	1.71		mg/Kg		102	76 - 120
Benzaldehyde	1.68	1.16		mg/Kg		69	18 - 88
Benzo[a]anthracene	1.67	1.66		mg/Kg		99	73 - 114
Benzo[a]pyrene	1.67	1.56		mg/Kg		94	76 - 113
Benzo[b]fluoranthene	1.67	1.51		mg/Kg		90	73 - 117
Benzo[g,h,i]perylene	1.67	1.53		mg/Kg		92	77 - 114
Benzo[k]fluoranthene	1.67	1.58		mg/Kg		95	66 - 122

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-70093/2-A
Matrix: Solid
Analysis Batch: 70185

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 70093

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Butylbenzylphthalate	1.67	1.49		mg/Kg		89	62 - 123
Caprolactam	1.68	1.24		mg/Kg		74	66 - 109
Carbazole	1.67	1.60		mg/Kg		96	74 - 117
Chrysene	1.67	1.56		mg/Kg		94	66 - 111
Di-n-butyl phthalate	1.67	1.58		mg/Kg		95	70 - 126
Di-n-octyl phthalate	1.67	1.64		mg/Kg		98	60 - 133
Dibenz(a,h)anthracene	1.67	1.61		mg/Kg		96	81 - 121
Dibenzofuran	1.67	1.48		mg/Kg		89	62 - 113
Diethyl phthalate	1.67	1.50		mg/Kg		90	68 - 116
4-Chloroaniline	1.67	0.799		mg/Kg		48	38 - 90
Dimethyl phthalate	1.67	1.45		mg/Kg		87	66 - 113
Fluoranthene	1.67	1.57		mg/Kg		94	65 - 114
4-Chlorophenyl-phenyl ether	1.67	1.42		mg/Kg		85	58 - 110
Fluorene	1.67	1.45		mg/Kg		87	62 - 110
Hexachlorobenzene	1.67	1.41		mg/Kg		84	69 - 116
Hexachlorobutadiene	1.67	1.20		mg/Kg		72	49 - 106
Hexachlorocyclopentadiene	1.67	1.38		mg/Kg		83	19 - 100
Hexachloroethane	1.67	1.15		mg/Kg		69	48 - 86
Indeno[1,2,3-cd]pyrene	1.67	1.59		mg/Kg		96	71 - 122
Isophorone	1.67	1.38		mg/Kg		83	52 - 103
N-Nitrosodi-n-propylamine	1.67	1.36		mg/Kg		82	51 - 100
N-Nitrosodiphenylamine	1.42	1.29		mg/Kg		91	74 - 115
Naphthalene	1.67	1.30		mg/Kg		78	60 - 94
Nitrobenzene	1.67	1.23		mg/Kg		74	50 - 99
Aniline	1.67	1.20		mg/Kg		72	37 - 77
Phenanthrene	1.67	1.51		mg/Kg		90	74 - 112
Phenol	1.67	1.51		mg/Kg		90	54 - 100
Pentachlorophenol	3.33	3.33		mg/Kg		100	51 - 121
Pyrene	1.67	1.50		mg/Kg		90	70 - 103
Bis(2-chloroethoxy)methane	1.67	1.24		mg/Kg		75	53 - 101
Bis(2-chloroethyl)ether	1.67	1.27		mg/Kg		76	49 - 94
Bis(2-ethylhexyl) phthalate	1.67	1.54		mg/Kg		92	62 - 123
Benzyl alcohol	1.67	1.51		mg/Kg		91	44 - 109
Pyridine	3.33	1.53		mg/Kg		46	30 - 62
1,4-Dioxane	1.67	0.645		mg/Kg		39	20 - 53

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*98*		*13 - 121*
2-Fluorobiphenyl (Surr)	*85*		*39 - 100*
2-Fluorophenol (Surr)	*86*		*26 - 96*
Nitrobenzene-d5 (Surr)	*70*		*32 - 97*
p-Terphenyl-d14 (Surr)	*101*		*45 - 108*
Phenol-d5 (Surr)	*92*		*27 - 104*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-70093/3-A
Matrix: Solid
Analysis Batch: 70671

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 70093

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dicyclohexylamine			1.67	1.03	J	mg/Kg		62	49 - 141		
n,n'-Dimethylaniline			0.842	0.656		mg/Kg		78	32 - 133		
Triethylamine			1.67	ND	*-	mg/Kg		5	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*94*		*13 - 121*
2-Fluorobiphenyl (Surr)	*87*		*39 - 100*
2-Fluorophenol (Surr)	*83*		*26 - 96*
Nitrobenzene-d5 (Surr)	*73*		*32 - 97*
p-Terphenyl-d14 (Surr)	*109*	*S1+*	*45 - 108*
Phenol-d5 (Surr)	*84*		*27 - 104*

Lab Sample ID: LCSD 410-70093/4-A
Matrix: Solid
Analysis Batch: 70185

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 70093

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dicyclohexylamine			1.67	1.09	J	mg/Kg		65	49 - 141	5	30
n,n'-Dimethylaniline			0.842	0.531		mg/Kg		63	32 - 133	21	30
Triethylamine			1.67	ND	*- *1	mg/Kg		36	70 - 130	149	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*99*		*13 - 121*
2-Fluorobiphenyl (Surr)	*86*		*39 - 100*
2-Fluorophenol (Surr)	*84*		*26 - 96*
Nitrobenzene-d5 (Surr)	*70*		*32 - 97*
p-Terphenyl-d14 (Surr)	*117*	*S1+*	*45 - 108*
Phenol-d5 (Surr)	*85*		*27 - 104*

Lab Sample ID: 410-21255-3 MS
Matrix: Soil
Analysis Batch: 70671

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Prep Type: Total/NA
Prep Batch: 70093

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1'-Biphenyl	ND		2.06	1.66		mg/Kg	☼	81	59 - 106		
1,2,4,5-Tetrachlorobenzene	ND		2.06	1.59		mg/Kg	☼	77	60 - 102		
2,2'-oxybis[1-chloropropane]	ND		2.06	1.52		mg/Kg	☼	74	44 - 105		
2,3,4,6-Tetrachlorophenol	ND		2.06	1.72		mg/Kg	☼	84	66 - 116		
2,4,5-Trichlorophenol	ND		2.06	1.75		mg/Kg	☼	85	67 - 110		
2,4,6-Trichlorophenol	ND		2.06	1.72		mg/Kg	☼	84	60 - 120		
2,4-Dichlorophenol	ND		2.06	1.67		mg/Kg	☼	81	64 - 109		
2,4-Dimethylphenol	ND		2.06	1.76		mg/Kg	☼	85	46 - 88		
2,4-Dinitrophenol	ND	F1	4.12	0.439	J F1	mg/Kg	☼	11	47 - 126		
2,4-Dinitrotoluene	ND	F2 F1	2.06	1.13	F1	mg/Kg	☼	55	67 - 115		
2,6-Dinitrotoluene	ND	F2 F1	2.06	1.24	F1	mg/Kg	☼	60	67 - 113		
2-Chloronaphthalene	ND		2.06	1.70		mg/Kg	☼	83	56 - 112		
2-Chlorophenol	ND		2.06	1.60		mg/Kg	☼	78	59 - 97		
2-Methylnaphthalene	ND		2.06	1.72		mg/Kg	☼	84	63 - 101		

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-21255-3 MS
Matrix: Soil
Analysis Batch: 70671

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Prep Type: Total/NA
Prep Batch: 70093

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Methylphenol	ND		2.06	1.73		mg/Kg	☼	84	56 - 105
2-Nitroaniline	ND	F1	2.06	1.53		mg/Kg	☼	74	63 - 119
2-Nitrophenol	ND	F1	2.06	0.428	F1	mg/Kg	☼	21	55 - 104
3,3'-Dichlorobenzidine	ND		4.12	3.31		mg/Kg	☼	80	40 - 107
3-Nitroaniline	ND		2.06	1.26		mg/Kg	☼	61	59 - 124
4,6-Dinitro-2-methylphenol	ND	F2 F1	4.12	0.993	F1	mg/Kg	☼	24	63 - 126
4-Bromophenyl-phenylether	ND		2.06	1.74		mg/Kg	☼	85	68 - 114
4-Chloro-3-methylphenol	ND		2.06	1.70		mg/Kg	☼	83	62 - 117
3,4-Methylphenol	ND		2.06	1.54		mg/Kg	☼	75	56 - 100
4-Nitroaniline	ND		2.06	1.65		mg/Kg	☼	80	45 - 99
4-Nitrophenol	ND		4.12	3.02		mg/Kg	☼	73	52 - 114
Acenaphthene	ND		2.06	1.69		mg/Kg	☼	82	61 - 104
Acenaphthylene	ND		2.06	2.04		mg/Kg	☼	99	59 - 116
Acetophenone	ND		2.06	1.47		mg/Kg	☼	72	54 - 95
Anthracene	ND		2.06	1.87		mg/Kg	☼	91	75 - 114
Atrazine	ND		2.08	1.95		mg/Kg	☼	94	76 - 120
Benzaldehyde	ND		2.08	1.43		mg/Kg	☼	69	18 - 88
Benzo[a]anthracene	ND		2.06	1.89		mg/Kg	☼	92	73 - 114
Benzo[a]pyrene	ND		2.06	1.70		mg/Kg	☼	82	76 - 113
Benzo[b]fluoranthene	ND		2.06	1.61		mg/Kg	☼	78	73 - 117
Benzo[g,h,i]perylene	ND		2.06	1.72		mg/Kg	☼	84	77 - 114
Benzo[k]fluoranthene	ND		2.06	1.84		mg/Kg	☼	89	66 - 122
Butylbenzylphthalate	ND		2.06	1.71		mg/Kg	☼	83	62 - 123
Caprolactam	ND		2.08	1.56		mg/Kg	☼	75	66 - 109
Carbazole	ND		2.06	1.87		mg/Kg	☼	91	74 - 117
Chrysene	ND		2.06	1.77		mg/Kg	☼	86	66 - 111
Di-n-butyl phthalate	ND		2.06	1.79		mg/Kg	☼	87	70 - 126
Di-n-octyl phthalate	ND		2.06	1.80		mg/Kg	☼	87	60 - 133
Dibenz(a,h)anthracene	ND	F1	2.06	1.77		mg/Kg	☼	86	81 - 121
Dibenzofuran	ND		2.06	1.72		mg/Kg	☼	84	62 - 113
Diethyl phthalate	ND		2.06	1.70		mg/Kg	☼	83	68 - 116
4-Chloroaniline	ND		2.06	0.938		mg/Kg	☼	46	38 - 90
Dimethyl phthalate	ND	F2 F1	2.06	1.66		mg/Kg	☼	80	66 - 113
Fluoranthene	ND		2.06	1.79		mg/Kg	☼	87	65 - 114
4-Chlorophenyl-phenyl ether	ND		2.06	1.66		mg/Kg	☼	81	58 - 110
Fluorene	ND		2.06	1.71		mg/Kg	☼	83	62 - 110
Hexachlorobenzene	ND		2.06	1.69		mg/Kg	☼	82	69 - 116
Hexachlorobutadiene	ND		2.06	1.49		mg/Kg	☼	72	49 - 106
Hexachlorocyclopentadiene	ND	F1	2.06	ND	F1	mg/Kg	☼	0	19 - 100
Hexachloroethane	ND	F2 F1	2.06	1.05		mg/Kg	☼	51	48 - 86
Indeno[1,2,3-cd]pyrene	ND		2.06	1.79		mg/Kg	☼	87	71 - 122
Isophorone	ND		2.06	1.72		mg/Kg	☼	83	52 - 103
N-Nitrosodi-n-propylamine	ND		2.06	1.61		mg/Kg	☼	78	51 - 100
N-Nitrosodiphenylamine	ND		1.75	1.54		mg/Kg	☼	88	74 - 115
Naphthalene	ND		2.06	1.59		mg/Kg	☼	77	60 - 94
Nitrobenzene	ND		2.06	1.42		mg/Kg	☼	69	50 - 99
Aniline	ND		2.06	1.13		mg/Kg	☼	55	37 - 77
Phenanthrene	ND		2.06	1.76		mg/Kg	☼	86	74 - 112
Phenol	ND		2.06	1.68		mg/Kg	☼	81	54 - 100

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-21255-3 MS
Matrix: Soil
Analysis Batch: 70671

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Prep Type: Total/NA
Prep Batch: 70093

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	ND		4.12	3.35		mg/Kg	☼	81	51 - 121
Pyrene	ND		2.06	1.74		mg/Kg	☼	84	70 - 103
Bis(2-chloroethoxy)methane	ND		2.06	1.43		mg/Kg	☼	70	53 - 101
Bis(2-chloroethyl)ether	ND		2.06	1.43		mg/Kg	☼	70	49 - 94
Bis(2-ethylhexyl) phthalate	ND		2.06	1.77		mg/Kg	☼	86	62 - 123
Benzyl alcohol	ND		2.06	1.72		mg/Kg	☼	84	44 - 109
Pyridine	ND		4.12	1.76		mg/Kg	☼	43	30 - 62
1,4-Dioxane	ND		2.06	0.768		mg/Kg	☼	37	20 - 53

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*81*		*13 - 121*
2-Fluorobiphenyl (Surr)	*83*		*39 - 100*
2-Fluorophenol (Surr)	*80*		*26 - 96*
Nitrobenzene-d5 (Surr)	*67*		*32 - 97*
p-Terphenyl-d14 (Surr)	*92*		*45 - 108*
Phenol-d5 (Surr)	*83*		*27 - 104*

Lab Sample ID: 410-21255-3 MSD
Matrix: Soil
Analysis Batch: 70671

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Prep Type: Total/NA
Prep Batch: 70093

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1'-Biphenyl	ND		2.04	1.42		mg/Kg	☼	69	59 - 106	16	30
1,2,4,5-Tetrachlorobenzene	ND		2.04	1.31		mg/Kg	☼	64	60 - 102	19	30
2,2'-oxybis[1-chloropropane]	ND		2.04	1.30		mg/Kg	☼	64	44 - 105	16	30
2,3,4,6-Tetrachlorophenol	ND		2.04	1.50		mg/Kg	☼	73	66 - 116	14	30
2,4,5-Trichlorophenol	ND		2.04	1.50		mg/Kg	☼	73	67 - 110	16	30
2,4,6-Trichlorophenol	ND		2.04	1.47		mg/Kg	☼	72	60 - 120	16	30
2,4-Dichlorophenol	ND		2.04	1.43		mg/Kg	☼	70	64 - 109	15	30
2,4-Dimethylphenol	ND		2.04	1.50		mg/Kg	☼	73	46 - 88	16	30
2,4-Dinitrophenol	ND	F1	4.09	0.435	J F1	mg/Kg	☼	11	47 - 126	1	30
2,4-Dinitrotoluene	ND	F2 F1	2.04	0.744	F2 F1	mg/Kg	☼	36	67 - 115	41	30
2,6-Dinitrotoluene	ND	F2 F1	2.04	0.859	F2 F1	mg/Kg	☼	42	67 - 113	37	30
2-Chloronaphthalene	ND		2.04	1.46		mg/Kg	☼	71	56 - 112	15	30
2-Chlorophenol	ND		2.04	1.36		mg/Kg	☼	66	59 - 97	16	30
2-Methylnaphthalene	ND		2.04	1.49		mg/Kg	☼	73	63 - 101	15	30
2-Methylphenol	ND		2.04	1.51		mg/Kg	☼	74	56 - 105	13	30
2-Nitroaniline	ND	F1	2.04	1.19	F1	mg/Kg	☼	58	63 - 119	25	30
2-Nitrophenol	ND	F1	2.04	0.335	F1	mg/Kg	☼	16	55 - 104	24	30
3,3'-Dichlorobenzidine	ND		4.09	2.75		mg/Kg	☼	67	40 - 107	19	30
3-Nitroaniline	ND		2.04	1.63		mg/Kg	☼	80	59 - 124	26	30
4,6-Dinitro-2-methylphenol	ND	F2 F1	4.09	0.705	F2 F1	mg/Kg	☼	17	63 - 126	34	30
4-Bromophenyl-phenylether	ND		2.04	1.53		mg/Kg	☼	75	68 - 114	13	30
4-Chloro-3-methylphenol	ND		2.04	1.50		mg/Kg	☼	74	62 - 117	12	30
3,4-Methylphenol	ND		2.04	1.36		mg/Kg	☼	67	56 - 100	12	30
4-Nitroaniline	ND		2.04	1.41		mg/Kg	☼	69	45 - 99	15	30
4-Nitrophenol	ND		4.09	2.77		mg/Kg	☼	68	52 - 114	9	30
Acenaphthene	ND		2.04	1.48		mg/Kg	☼	72	61 - 104	13	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-21255-3 MSD
Matrix: Soil
Analysis Batch: 70671

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Prep Type: Total/NA
Prep Batch: 70093

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthylene	ND		2.04	1.85		mg/Kg	☼	90	59 - 116	10	30
Acetophenone	ND		2.04	1.27		mg/Kg	☼	62	54 - 95	15	30
Anthracene	ND		2.04	1.69		mg/Kg	☼	83	75 - 114	10	30
Atrazine	ND		2.06	1.69		mg/Kg	☼	82	76 - 120	14	30
Benzaldehyde	ND		2.06	1.14		mg/Kg	☼	55	18 - 88	23	30
Benzo[a]anthracene	ND		2.04	1.69		mg/Kg	☼	83	73 - 114	12	30
Benzo[a]pyrene	ND		2.04	1.60		mg/Kg	☼	78	76 - 113	6	30
Benzo[b]fluoranthene	ND		2.04	1.49		mg/Kg	☼	73	73 - 117	7	30
Benzo[g,h,i]perylene	ND		2.04	1.65		mg/Kg	☼	81	77 - 114	4	30
Benzo[k]fluoranthene	ND		2.04	1.68		mg/Kg	☼	82	66 - 122	9	30
Butylbenzylphthalate	ND		2.04	1.48		mg/Kg	☼	72	62 - 123	14	30
Caprolactam	ND		2.06	1.41		mg/Kg	☼	68	66 - 109	10	30
Carbazole	ND		2.04	1.72		mg/Kg	☼	84	74 - 117	8	30
Chrysene	ND		2.04	1.58		mg/Kg	☼	77	66 - 111	11	30
Di-n-butyl phthalate	ND		2.04	1.65		mg/Kg	☼	81	70 - 126	8	30
Di-n-octyl phthalate	ND		2.04	1.64		mg/Kg	☼	80	60 - 133	9	30
Dibenz(a,h)anthracene	ND	F1	2.04	1.64	F1	mg/Kg	☼	80	81 - 121	8	30
Dibenzofuran	ND		2.04	1.47		mg/Kg	☼	72	62 - 113	16	30
Diethyl phthalate	ND		2.04	1.46		mg/Kg	☼	71	68 - 116	16	30
4-Chloroaniline	ND		2.04	0.864		mg/Kg	☼	42	38 - 90	8	30
Dimethyl phthalate	ND	F2 F1	2.04	1.20	F2 F1	mg/Kg	☼	59	66 - 113	32	30
Fluoranthene	ND		2.04	1.68		mg/Kg	☼	82	65 - 114	6	30
4-Chlorophenyl-phenyl ether	ND		2.04	1.43		mg/Kg	☼	70	58 - 110	15	30
Fluorene	ND		2.04	1.50		mg/Kg	☼	73	62 - 110	13	30
Hexachlorobenzene	ND		2.04	1.50		mg/Kg	☼	73	69 - 116	12	30
Hexachlorobutadiene	ND		2.04	1.24		mg/Kg	☼	61	49 - 106	18	30
Hexachlorocyclopentadiene	ND	F1	2.04	ND	F1	mg/Kg	☼	0	19 - 100	NC	30
Hexachloroethane	ND	F2 F1	2.04	0.746	F2 F1	mg/Kg	☼	36	48 - 86	34	30
Indeno[1,2,3-cd]pyrene	ND		2.04	1.67		mg/Kg	☼	82	71 - 122	7	30
Isophorone	ND		2.04	1.46		mg/Kg	☼	72	52 - 103	16	30
N-Nitrosodi-n-propylamine	ND		2.04	1.39		mg/Kg	☼	68	51 - 100	15	30
N-Nitrosodiphenylamine	ND		1.74	1.36		mg/Kg	☼	78	74 - 115	13	30
Naphthalene	ND		2.04	1.36		mg/Kg	☼	66	60 - 94	16	30
Nitrobenzene	ND		2.04	1.16		mg/Kg	☼	57	50 - 99	20	30
Aniline	ND		2.04	1.07		mg/Kg	☼	52	37 - 77	5	30
Phenanthrene	ND		2.04	1.56		mg/Kg	☼	76	74 - 112	12	30
Phenol	ND		2.04	1.45		mg/Kg	☼	71	54 - 100	14	30
Pentachlorophenol	ND		4.09	2.72		mg/Kg	☼	66	51 - 121	21	30
Pyrene	ND		2.04	1.56		mg/Kg	☼	76	70 - 103	11	30
Bis(2-chloroethoxy)methane	ND		2.04	1.19		mg/Kg	☼	58	53 - 101	18	30
Bis(2-chloroethyl)ether	ND		2.04	1.21		mg/Kg	☼	59	49 - 94	17	30
Bis(2-ethylhexyl) phthalate	ND		2.04	1.61		mg/Kg	☼	79	62 - 123	10	30
Benzyl alcohol	ND		2.04	1.43		mg/Kg	☼	70	44 - 109	19	30
Pyridine	ND		4.09	1.41		mg/Kg	☼	34	30 - 62	22	30
1,4-Dioxane	ND		2.04	0.622		mg/Kg	☼	30	20 - 53	21	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*71*		*13 - 121*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-21255-3 MSD
Matrix: Soil
Analysis Batch: 70671

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Prep Type: Total/NA
Prep Batch: 70093

Surrogate	MSD %Recovery	MSD Qualifier	Limits
2-Fluorobiphenyl (Surr)	71		39 - 100
2-Fluorophenol (Surr)	67		26 - 96
Nitrobenzene-d5 (Surr)	55		32 - 97
p-Terphenyl-d14 (Surr)	83		45 - 108
Phenol-d5 (Surr)	72		27 - 104

Lab Sample ID: MB 410-72721/1-A
Matrix: Water
Analysis Batch: 73743

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 72721

Tentatively Identified Compound	MB Est. Result	MB Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L				12/03/20 17:00	12/07/20 15:55	1

Lab Sample ID: LCS 410-72721/2-A
Matrix: Water
Analysis Batch: 73743

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 72721

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	50.0	20.5		ug/L		41	21 - 64

Lab Sample ID: LCSD 410-72721/3-A
Matrix: Water
Analysis Batch: 73743

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 72721

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	50.0	20.8		ug/L		42	21 - 64	1	30

Lab Sample ID: LCS 410-72730/2-A
Matrix: Solid
Analysis Batch: 72964

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 72730

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	1670	621		ug/Kg		37	20 - 53

Method: 8315A - Carbonyl Compounds by HPLC

Lab Sample ID: MB 410-68417/1-A
Matrix: Water
Analysis Batch: 69590

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 68417

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 18:32	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 18:32	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 18:32	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	98		39 - 153	11/20/20 16:15	11/23/20 18:32	1

Method: 8315A - Carbonyl Compounds by HPLC (Continued)

Lab Sample ID: LCS 410-68417/2-A
Matrix: Water
Analysis Batch: 69590

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 68417

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Acetaldehyde			499	524		ug/L		105	76 - 119		
Formaldehyde			503	470		ug/L		93	77 - 122		
Glutaraldehyde			503	547		ug/L		109	79 - 127		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Butyraldehyde	*97*		*39 - 153*

Lab Sample ID: LCSD 410-68417/3-A
Matrix: Water
Analysis Batch: 69590

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 68417

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetaldehyde			499	523		ug/L		105	76 - 119	0	30
Formaldehyde			503	464		ug/L		92	77 - 122	1	30
Glutaraldehyde			503	539		ug/L		107	79 - 127	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Butyraldehyde	*94*		*39 - 153*

Lab Sample ID: MB 410-68419/1-A
Matrix: Solid
Analysis Batch: 69590

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 68419

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.050	0.025	mg/Kg		11/20/20 13:08	11/23/20 21:59	1
Formaldehyde	ND		0.075	0.025	mg/Kg		11/20/20 13:08	11/23/20 21:59	1
Glutaraldehyde	ND		0.050	0.025	mg/Kg		11/20/20 13:08	11/23/20 21:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*113*		*77 - 133*	*11/20/20 13:08*	*11/23/20 21:59*	*1*

Lab Sample ID: LCS 410-68419/2-A
Matrix: Solid
Analysis Batch: 69590

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 68419

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Acetaldehyde			0.499	0.591	*	mg/Kg		119	83 - 115		
Formaldehyde			0.503	0.439		mg/Kg		87	81 - 120		
Glutaraldehyde			0.503	0.577		mg/Kg		115	84 - 123		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Butyraldehyde	*108*		*77 - 133*

Method: 8315A - Carbonyl Compounds by HPLC (Continued)

Lab Sample ID: 410-21255-2 MS
Matrix: Soil
Analysis Batch: 69590

Client Sample ID: B55-PDI-SB-17 (9-10)
Prep Type: Total/NA
Prep Batch: 68419

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetaldehyde	ND	* F1	0.588	0.699	F1	mg/Kg	☼	119	83 - 115
Formaldehyde	0.12		0.593	0.665		mg/Kg	☼	91	81 - 120
Glutaraldehyde	ND		0.593	0.676		mg/Kg	☼	114	84 - 123

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Butyraldehyde	*105*		*77 - 133*

Lab Sample ID: 410-21255-2 MSD
Matrix: Soil
Analysis Batch: 69590

Client Sample ID: B55-PDI-SB-17 (9-10)
Prep Type: Total/NA
Prep Batch: 68419

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetaldehyde	ND	* F1	0.588	0.684	F1	mg/Kg	☼	116	83 - 115	2	50
Formaldehyde	0.12		0.593	0.698		mg/Kg	☼	97	81 - 120	5	50
Glutaraldehyde	ND		0.593	0.670		mg/Kg	☼	113	84 - 123	1	50

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Butyraldehyde	*103*		*77 - 133*

Lab Sample ID: MB 410-70762/1-A
Matrix: Solid
Analysis Batch: 72559

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70762

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.050	0.025	mg/Kg		11/29/20 10:15	12/03/20 11:48	1
Formaldehyde	ND		0.075	0.025	mg/Kg		11/29/20 10:15	12/03/20 11:48	1
Glutaraldehyde	ND		0.050	0.025	mg/Kg		11/29/20 10:15	12/03/20 11:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*83*		*77 - 133*	*11/29/20 10:15*	*12/03/20 11:48*	*1*

Lab Sample ID: LCS 410-70762/2-A
Matrix: Solid
Analysis Batch: 72559

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 70762

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetaldehyde			0.499	0.527		mg/Kg		106	83 - 115
Formaldehyde			0.503	0.495		mg/Kg		98	81 - 120
Glutaraldehyde			0.503	0.504		mg/Kg		100	84 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Butyraldehyde	*100*		*77 - 133*

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

GC/MS VOA

Prep Batch: 67806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-2	B55-PDI-SB-17 (9-10)	Total/NA	Soil	5035	
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	5035	
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	Total/NA	Soil	5035	
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	5035	
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	Total/NA	Soil	5035	
410-21255-9	B55-PDI-SB-06 (12-13)	Total/NA	Soil	5035	

Prep Batch: 68324

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	5035	
410-21255-8	B55-PDI-SB-17 (8-9)	Total/NA	Soil	5035	

Analysis Batch: 69809

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-2	B55-PDI-SB-17 (9-10)	Total/NA	Soil	8260C	67806
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	8260C	67806
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	Total/NA	Soil	8260C	67806
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	8260C	67806
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	Total/NA	Soil	8260C	67806
410-21255-9	B55-PDI-SB-06 (12-13)	Total/NA	Soil	8260C	67806
MB 410-69809/10	Method Blank	Total/NA	Solid	8260C	
LCS 410-69809/5	Lab Control Sample	Total/NA	Solid	8260C	
LCS 410-69809/7	Lab Control Sample	Total/NA	Solid	8260C	
LCSD 410-69809/6	Lab Control Sample Dup	Total/NA	Solid	8260C	
LCSD 410-69809/8	Lab Control Sample Dup	Total/NA	Solid	8260C	

Analysis Batch: 70130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	8260C	68324
410-21255-8	B55-PDI-SB-17 (8-9)	Total/NA	Soil	8260C	68324
MB 410-70130/9	Method Blank	Total/NA	Solid	8260C	
LCS 410-70130/5	Lab Control Sample	Total/NA	Solid	8260C	
LCS 410-70130/7	Lab Control Sample	Total/NA	Solid	8260C	
LCSD 410-70130/6	Lab Control Sample Dup	Total/NA	Solid	8260C	
LCSD 410-70130/8	Lab Control Sample Dup	Total/NA	Solid	8260C	

Analysis Batch: 70702

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-1	B55-PDI-SB-21	Total/NA	Groundwater	8260C	
410-21255-10	TB20083	Total/NA	Water	8260C	
MB 410-70702/10	Method Blank	Total/NA	Water	8260C	
LCS 410-70702/5	Lab Control Sample	Total/NA	Water	8260C	
LCS 410-70702/7	Lab Control Sample	Total/NA	Water	8260C	
LCSD 410-70702/6	Lab Control Sample Dup	Total/NA	Water	8260C	
LCSD 410-70702/8	Lab Control Sample Dup	Total/NA	Water	8260C	
410-21255-1 MS	B55-PDI-SB-21	Total/NA	Groundwater	8260C	
410-21255-1 MSD	B55-PDI-SB-21	Total/NA	Groundwater	8260C	

GC/MS Semi VOA

Prep Batch: 69548

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-1	B55-PDI-SB-21	Total/NA	Groundwater	3510C	
MB 410-69548/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-69548/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCS 410-69548/5-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-69548/6-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Prep Batch: 70093

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-2	B55-PDI-SB-17 (9-10)	Total/NA	Soil	3546	
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	3546	
410-21255-3 - DL	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	3546	
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	Total/NA	Soil	3546	
410-21255-5 - DL	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	3546	
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	3546	
410-21255-6 - DL	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	3546	
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	3546	
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	Total/NA	Soil	3546	
410-21255-8 - DL	B55-PDI-SB-17 (8-9)	Total/NA	Soil	3546	
410-21255-8	B55-PDI-SB-17 (8-9)	Total/NA	Soil	3546	
410-21255-9	B55-PDI-SB-06 (12-13)	Total/NA	Soil	3546	
410-21255-9 - DL	B55-PDI-SB-06 (12-13)	Total/NA	Soil	3546	
MB 410-70093/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-70093/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCS 410-70093/3-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 410-70093/4-A	Lab Control Sample Dup	Total/NA	Solid	3546	
410-21255-3 MS	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	3546	
410-21255-3 MSD	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	3546	

Analysis Batch: 70185

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-2	B55-PDI-SB-17 (9-10)	Total/NA	Soil	8270D	70093
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	Total/NA	Soil	8270D	70093
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	8270D	70093
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	8270D	70093
410-21255-8	B55-PDI-SB-17 (8-9)	Total/NA	Soil	8270D	70093
LCS 410-70093/2-A	Lab Control Sample	Total/NA	Solid	8270D	70093
LCSD 410-70093/4-A	Lab Control Sample Dup	Total/NA	Solid	8270D	70093

Analysis Batch: 70671

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	8270D	70093
410-21255-9	B55-PDI-SB-06 (12-13)	Total/NA	Soil	8270D	70093
410-21255-9 - DL	B55-PDI-SB-06 (12-13)	Total/NA	Soil	8270D	70093
MB 410-70093/1-A	Method Blank	Total/NA	Solid	8270D	70093
LCS 410-70093/3-A	Lab Control Sample	Total/NA	Solid	8270D	70093
410-21255-3 MS	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	8270D	70093
410-21255-3 MSD	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	8270D	70093

Analysis Batch: 70935

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-5 - DL	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	8270D	70093

GC/MS Semi VOA (Continued)

Analysis Batch: 70935 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	Total/NA	Soil	8270D	70093

Analysis Batch: 71928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-1	B55-PDI-SB-21	Total/NA	Groundwater	8270D	69548
MB 410-69548/1-A	Method Blank	Total/NA	Water	8270D	69548
LCS 410-69548/2-A	Lab Control Sample	Total/NA	Water	8270D	69548
LCS 410-69548/5-A	Lab Control Sample	Total/NA	Water	8270D	69548
LCSD 410-69548/6-A	Lab Control Sample Dup	Total/NA	Water	8270D	69548

Analysis Batch: 71938

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-6 - DL	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	8270D	70093
410-21255-8 - DL	B55-PDI-SB-17 (8-9)	Total/NA	Soil	8270D	70093

Analysis Batch: 72348

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-3 - DL	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	8270D	70093

Prep Batch: 72721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-1 - REDL	B55-PDI-SB-21	Total/NA	Groundwater	3510C	
410-21255-1 - RE	B55-PDI-SB-21	Total/NA	Groundwater	3510C	
MB 410-72721/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-72721/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCS 410-72721/4-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-72721/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
LCSD 410-72721/5-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Prep Batch: 72730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-2 - RE	B55-PDI-SB-17 (9-10)	Total/NA	Soil	3546	
410-21255-3 - RE	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	3546	
410-21255-4 - RE	B55-PDI-SB-18 (10.7-11.7)	Total/NA	Soil	3546	
410-21255-5 - RE	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	3546	
410-21255-6 - RE	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	3546	
410-21255-7 - RE	B55-PDI-SB-21 (4.5-5.5)	Total/NA	Soil	3546	
410-21255-8 - RE	B55-PDI-SB-17 (8-9)	Total/NA	Soil	3546	
410-21255-9 - RE	B55-PDI-SB-06 (12-13)	Total/NA	Soil	3546	
MB 410-72730/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-72730/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCS 410-72730/3-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 410-72730/4-A	Lab Control Sample Dup	Total/NA	Solid	3546	

Analysis Batch: 72964

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-2 - RE	B55-PDI-SB-17 (9-10)	Total/NA	Soil	8270D	72730
410-21255-3 - RE	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	8270D	72730
410-21255-4 - RE	B55-PDI-SB-18 (10.7-11.7)	Total/NA	Soil	8270D	72730
410-21255-5 - RE	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	8270D	72730
410-21255-6 - RE	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	8270D	72730

GC/MS Semi VOA (Continued)

Analysis Batch: 72964 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-7 - RE	B55-PDI-SB-21 (4.5-5.5)	Total/NA	Soil	8270D	72730
410-21255-8 - RE	B55-PDI-SB-17 (8-9)	Total/NA	Soil	8270D	72730
410-21255-9 - RE	B55-PDI-SB-06 (12-13)	Total/NA	Soil	8270D	72730
MB 410-72730/1-A	Method Blank	Total/NA	Solid	8270D	72730
LCS 410-72730/2-A	Lab Control Sample	Total/NA	Solid	8270D	72730
LCS 410-72730/3-A	Lab Control Sample	Total/NA	Solid	8270D	72730
LCSD 410-72730/4-A	Lab Control Sample Dup	Total/NA	Solid	8270D	72730

Analysis Batch: 73743

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-1 - RE	B55-PDI-SB-21	Total/NA	Groundwater	8270D	72721
410-21255-1 - REDL	B55-PDI-SB-21	Total/NA	Groundwater	8270D	72721
MB 410-72721/1-A	Method Blank	Total/NA	Water	8270D	72721
LCS 410-72721/2-A	Lab Control Sample	Total/NA	Water	8270D	72721
LCS 410-72721/4-A	Lab Control Sample	Total/NA	Water	8270D	72721
LCSD 410-72721/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	72721
LCSD 410-72721/5-A	Lab Control Sample Dup	Total/NA	Water	8270D	72721

HPLC/IC

Prep Batch: 68417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-1	B55-PDI-SB-21	Total/NA	Groundwater	8315A Prep	
MB 410-68417/1-A	Method Blank	Total/NA	Water	8315A Prep	
LCS 410-68417/2-A	Lab Control Sample	Total/NA	Water	8315A Prep	
LCSD 410-68417/3-A	Lab Control Sample Dup	Total/NA	Water	8315A Prep	

Prep Batch: 68419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-2	B55-PDI-SB-17 (9-10)	Total/NA	Soil	8315A Prep	
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	8315A Prep	
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	Total/NA	Soil	8315A Prep	
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	8315A Prep	
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	8315A Prep	
410-21255-8	B55-PDI-SB-17 (8-9)	Total/NA	Soil	8315A Prep	
410-21255-9	B55-PDI-SB-06 (12-13)	Total/NA	Soil	8315A Prep	
MB 410-68419/1-A	Method Blank	Total/NA	Solid	8315A Prep	
LCS 410-68419/2-A	Lab Control Sample	Total/NA	Solid	8315A Prep	
410-21255-2 MS	B55-PDI-SB-17 (9-10)	Total/NA	Soil	8315A Prep	
410-21255-2 MSD	B55-PDI-SB-17 (9-10)	Total/NA	Soil	8315A Prep	

Analysis Batch: 69590

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-1	B55-PDI-SB-21	Total/NA	Groundwater	8315A	68417
410-21255-2	B55-PDI-SB-17 (9-10)	Total/NA	Soil	8315A	68419
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	8315A	68419
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	Total/NA	Soil	8315A	68419
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	8315A	68419
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	8315A	68419
410-21255-8	B55-PDI-SB-17 (8-9)	Total/NA	Soil	8315A	68419
410-21255-9	B55-PDI-SB-06 (12-13)	Total/NA	Soil	8315A	68419

HPLC/IC (Continued)

Analysis Batch: 69590 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 410-68417/1-A	Method Blank	Total/NA	Water	8315A	68417
MB 410-68419/1-A	Method Blank	Total/NA	Solid	8315A	68419
LCS 410-68417/2-A	Lab Control Sample	Total/NA	Water	8315A	68417
LCS 410-68419/2-A	Lab Control Sample	Total/NA	Solid	8315A	68419
LCSD 410-68417/3-A	Lab Control Sample Dup	Total/NA	Water	8315A	68417
410-21255-2 MS	B55-PDI-SB-17 (9-10)	Total/NA	Soil	8315A	68419
410-21255-2 MSD	B55-PDI-SB-17 (9-10)	Total/NA	Soil	8315A	68419

Prep Batch: 70762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	Total/NA	Soil	8315A Prep	
MB 410-70762/1-A	Method Blank	Total/NA	Solid	8315A Prep	
LCS 410-70762/2-A	Lab Control Sample	Total/NA	Solid	8315A Prep	

Analysis Batch: 72559

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	Total/NA	Soil	8315A	70762
MB 410-70762/1-A	Method Blank	Total/NA	Solid	8315A	70762
LCS 410-70762/2-A	Lab Control Sample	Total/NA	Solid	8315A	70762

General Chemistry

Analysis Batch: 67799

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-2	B55-PDI-SB-17 (9-10)	Total/NA	Soil	Moisture	

Analysis Batch: 67819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	Total/NA	Soil	Moisture	
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	Total/NA	Soil	Moisture	
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	Total/NA	Soil	Moisture	
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	Total/NA	Soil	Moisture	
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	Total/NA	Soil	Moisture	
410-21255-8	B55-PDI-SB-17 (8-9)	Total/NA	Soil	Moisture	
410-21255-9	B55-PDI-SB-06 (12-13)	Total/NA	Soil	Moisture	

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-21
Date Collected: 11/17/20 13:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-1
Matrix: Groundwater

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	70702	11/28/20 14:33	UCB5	ELLE
Total/NA	Prep	3510C			69548	11/23/20 17:15	DFX4	ELLE
Total/NA	Analysis	8270D		1	71928	12/02/20 16:42	WKV3	ELLE
Total/NA	Prep	3510C	RE		72721	12/03/20 17:00	QQ3P	ELLE
Total/NA	Analysis	8270D	RE	1	73743	12/07/20 19:11	X3ZL	ELLE
Total/NA	Prep	3510C	REDL		72721	12/03/20 17:00	QQ3P	ELLE
Total/NA	Analysis	8270D	REDL	5	73743	12/07/20 19:39	X3ZL	ELLE
Total/NA	Prep	8315A Prep			68417	11/20/20 16:15	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 19:30	GM5C	ELLE

Client Sample ID: B55-PDI-SB-17 (9-10)
Date Collected: 11/17/20 13:10
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-2
Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	67799	11/18/20 22:01	PTG7	ELLE

Client Sample ID: B55-PDI-SB-17 (9-10)
Date Collected: 11/17/20 13:10
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-2
Matrix: Soil
Percent Solids: 84.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			67806	11/18/20 22:22	ULEH	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 15:56	Z6JB	ELLE
Total/NA	Prep	3546			70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D		1	70185	11/25/20 22:01	ULM3	ELLE
Total/NA	Prep	3546	RE		72730	12/03/20 16:08	EH	ELLE
Total/NA	Analysis	8270D	RE	1	72964	12/04/20 14:27	ULM3	ELLE
Total/NA	Prep	8315A Prep			68419	11/20/20 13:08	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 22:56	GM5C	ELLE

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Date Collected: 11/17/20 13:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-3
Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	67819	11/18/20 23:40	X4C8	ELLE

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Date Collected: 11/17/20 13:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-3
Matrix: Soil
Percent Solids: 81.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			67806	11/18/20 22:22	ULEH	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 16:19	Z6JB	ELLE

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)

Lab Sample ID: 410-21255-3
Matrix: Soil
Percent Solids: 81.0

Date Collected: 11/17/20 13:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D		1	70671	11/26/20 13:42	ULM3	ELLE
Total/NA	Prep	3546	DL		70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D	DL	2	72348	12/03/20 11:21	ULM3	ELLE
Total/NA	Prep	3546	RE		72730	12/03/20 16:08	EH	ELLE
Total/NA	Analysis	8270D	RE	1	72964	12/04/20 14:50	ULM3	ELLE
Total/NA	Prep	8315A Prep			68419	11/20/20 13:08	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 23:07	GM5C	ELLE

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)

Lab Sample ID: 410-21255-4
Matrix: Soil

Date Collected: 11/17/20 13:45
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	67819	11/18/20 23:40	X4C8	ELLE

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)

Lab Sample ID: 410-21255-4
Matrix: Soil
Percent Solids: 80.7

Date Collected: 11/17/20 13:45
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			67806	11/18/20 22:22	ULEH	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 16:41	Z6JB	ELLE
Total/NA	Prep	3546			70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D		1	70185	11/25/20 22:25	ULM3	ELLE
Total/NA	Prep	3546	RE		72730	12/03/20 16:08	EH	ELLE
Total/NA	Analysis	8270D	RE	1	72964	12/04/20 15:14	ULM3	ELLE
Total/NA	Prep	8315A Prep			68419	11/20/20 13:08	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 23:19	GM5C	ELLE

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)

Lab Sample ID: 410-21255-5
Matrix: Soil

Date Collected: 11/17/20 14:00
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	67819	11/18/20 23:40	X4C8	ELLE

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)

Lab Sample ID: 410-21255-5
Matrix: Soil
Percent Solids: 77.9

Date Collected: 11/17/20 14:00
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			67806	11/18/20 22:22	ULEH	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 17:03	Z6JB	ELLE
Total/NA	Prep	3546			70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D		1	70185	11/25/20 22:49	ULM3	ELLE

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)

Lab Sample ID: 410-21255-5
Matrix: Soil
Percent Solids: 77.9

Date Collected: 11/17/20 14:00 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546	DL		70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D	DL	3	70935	11/30/20 15:54	WKV3	ELLE
Total/NA	Prep	3546	RE		72730	12/03/20 16:08	EH	ELLE
Total/NA	Analysis	8270D	RE	1	72964	12/04/20 15:38	ULM3	ELLE
Total/NA	Prep	8315A Prep			68419	11/20/20 13:08	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 23:30	GM5C	ELLE

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)

Lab Sample ID: 410-21255-6
Matrix: Soil

Date Collected: 11/17/20 14:05 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	67819	11/18/20 23:40	X4C8	ELLE

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)

Lab Sample ID: 410-21255-6
Matrix: Soil
Percent Solids: 80.4

Date Collected: 11/17/20 14:05 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			68324	11/19/20 20:14	ULEH	ELLE
Total/NA	Analysis	8260C		50	70130	11/25/20 01:04	Z6JB	ELLE
Total/NA	Prep	3546			70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D		1	70185	11/25/20 23:13	ULM3	ELLE
Total/NA	Prep	3546	DL		70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D	DL	3	71938	12/02/20 16:32	ULM3	ELLE
Total/NA	Prep	3546	RE		72730	12/03/20 16:08	EH	ELLE
Total/NA	Analysis	8270D	RE	1	72964	12/04/20 16:02	ULM3	ELLE
Total/NA	Prep	8315A Prep			68419	11/20/20 13:08	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 23:42	GM5C	ELLE

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)

Lab Sample ID: 410-21255-7
Matrix: Soil

Date Collected: 11/17/20 14:15
Date Received: 11/18/20 11:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	67819	11/18/20 23:40	X4C8	ELLE

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)

Lab Sample ID: 410-21255-7
Matrix: Soil
Percent Solids: 85.8

Date Collected: 11/17/20 14:15
Date Received: 11/18/20 11:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			67806	11/18/20 22:22	ULEH	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 17:25	Z6JB	ELLE
Total/NA	Prep	3546			70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D		1	70935	11/30/20 20:43	WKV3	ELLE

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)

Lab Sample ID: 410-21255-7
Date Collected: 11/17/20 14:15
Matrix: Soil
Date Received: 11/18/20 11:46
Percent Solids: 85.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546	RE		72730	12/03/20 16:08	EH	ELLE
Total/NA	Analysis	8270D	RE	1	72964	12/04/20 16:26	ULM3	ELLE
Total/NA	Prep	8315A Prep			70762	11/29/20 10:15	DN9W	ELLE
Total/NA	Analysis	8315A		1	72559	12/03/20 12:34	GM5C	ELLE

Client Sample ID: B55-PDI-SB-17 (8-9)

Lab Sample ID: 410-21255-8
Date Collected: 11/17/20 14:30
Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment
Matrix: Soil
Date Received: 11/18/20 11:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	67819	11/18/20 23:40	X4C8	ELLE

Client Sample ID: B55-PDI-SB-17 (8-9)

Lab Sample ID: 410-21255-8
Date Collected: 11/17/20 14:30
Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Date Received: 11/18/20 11:46
Percent Solids: 82.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			68324	11/19/20 20:14	ULEH	ELLE
Total/NA	Analysis	8260C		50	70130	11/25/20 01:24	Z6JB	ELLE
Total/NA	Prep	3546			70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D		1	70185	11/26/20 00:01	ULM3	ELLE
Total/NA	Prep	3546	DL		70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D	DL	3	71938	12/02/20 16:56	ULM3	ELLE
Total/NA	Prep	3546	RE		72730	12/03/20 16:08	EH	ELLE
Total/NA	Analysis	8270D	RE	1	72964	12/04/20 16:50	ULM3	ELLE
Total/NA	Prep	8315A Prep			68419	11/20/20 13:08	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/24/20 00:16	GM5C	ELLE

Client Sample ID: B55-PDI-SB-06 (12-13)

Lab Sample ID: 410-21255-9
Date Collected: 11/17/20 14:45
Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Date Received: 11/18/20 11:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	67819	11/18/20 23:40	X4C8	ELLE

Client Sample ID: B55-PDI-SB-06 (12-13)

Lab Sample ID: 410-21255-9
Date Collected: 11/17/20 14:45
Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Date Received: 11/18/20 11:46
Percent Solids: 83.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			67806	11/18/20 22:22	ULEH	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 17:47	Z6JB	ELLE
Total/NA	Prep	3546			70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D		1	70671	11/26/20 12:53	ULM3	ELLE
Total/NA	Prep	3546	DL		70093	11/24/20 16:27	EH	ELLE
Total/NA	Analysis	8270D	DL	5	70671	11/26/20 13:18	ULM3	ELLE

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Client Sample ID: B55-PDI-SB-06 (12-13)

Lab Sample ID: 410-21255-9

Date Collected: 11/17/20 14:45
Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date
Date Received: 11/18/20 11:46

Matrix: Soil
Percent Solids: 83.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546	RE		72730	12/03/20 16:08	EH	ELLE
Total/NA	Analysis	8270D	RE	1	72964	12/04/20 17:14	ULM3	ELLE
Total/NA	Prep	8315A Prep			68419	11/20/20 13:08	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/24/20 00:27	GM5C	ELLE

Client Sample ID: TB20083

Lab Sample ID: 410-21255-10

Date Collected: 11/17/20 00:00
Date Received: 11/18/20 11:46

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	70702	11/28/20 14:11	UCB5	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New York	NELAP	10670	04-01-21

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8260C		Groundwater	Chlorodifluoromethane
8260C		Groundwater	Cyclohexanone
8260C		Groundwater	n-Heptane
8260C		Water	Chlorodifluoromethane
8260C		Water	Cyclohexanone
8260C		Water	n-Heptane
8260C	5035	Soil	Chlorodifluoromethane
8260C	5035	Soil	Cyclohexanone
8260C	5035	Soil	Ethyl ether
8260C	5035	Soil	n-Heptane
8260C	5035	Soil	Tetrahydrofuran
8270D	3510C	Groundwater	Dicyclohexylamine
8270D	3510C	Groundwater	n,n'-Dimethylaniline
8270D	3510C	Groundwater	Triethylamine
8270D	3546	Soil	Dicyclohexylamine
8270D	3546	Soil	n,n'-Dimethylaniline
8270D	3546	Soil	Triethylamine
8315A	8315A Prep	Groundwater	Acetaldehyde
8315A	8315A Prep	Groundwater	Glutaraldehyde
8315A	8315A Prep	Soil	Acetaldehyde
8315A	8315A Prep	Soil	Glutaraldehyde
Moisture		Soil	Percent Moisture

Method Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	ELLE
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	ELLE
8315A	Carbonyl Compounds by HPLC	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	ELLE
3546	Microwave Extraction	SW846	ELLE
5030C	Purge and Trap	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE
8315A Prep	Extraction (Carbonyl Compounds)	SW846	ELLE
8315A Prep	Solid Phase Extraction (SPE)	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21255-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-21255-1	B55-PDI-SB-21	Groundwater	11/17/20 13:00	11/18/20 11:46	
410-21255-2	B55-PDI-SB-17 (9-10)	Soil	11/17/20 13:10	11/18/20 11:46	
410-21255-3	B55-PDI-SB-19 (11.6-12.6)	Soil	11/17/20 13:30	11/18/20 11:46	
410-21255-4	B55-PDI-SB-18 (10.7-11.7)	Soil	11/17/20 13:45	11/18/20 11:46	
410-21255-5	B55-PDI-SB-19 (12.6-13.6)	Soil	11/17/20 14:00	11/18/20 11:46	
410-21255-6	B55-PDI-SB-18 (9.5-10.5)	Soil	11/17/20 14:05	11/18/20 11:46	
410-21255-7	B55-PDI-SB-21 (4.5-5.5)	Soil	11/17/20 14:15	11/18/20 11:46	
410-21255-8	B55-PDI-SB-17 (8-9)	Soil	11/17/20 14:30	11/18/20 11:46	
410-21255-9	B55-PDI-SB-06 (12-13)	Soil	11/17/20 14:45	11/18/20 11:46	
410-21255-10	TB20083	Water	11/17/20 00:00	11/18/20 11:46	

Environmental Analysis Custody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-21255 Chain of Custody

nental use only

COC # 616406

Client Information		Matrix						Analysis Requested												For Lab Use Only
								Preservation and Filtration Codes												
Client: ARCADIS	Acct. #:	Soil [X] Sediment [ ] Tissue	Water [X] Ground [ ] Potable [ ] Surface [ ] NPDES	Other:	Total # of Containers	Short-List Aldehydes SW846	SVOA 8270D/E (Microwave)	VOCs Solid by 8260 C/D	Short-List Aldehydes SW846	VOCs Water 8260C	SVOAs 8270D MINI									FSC:
Project Name/#: Bristol-Myers Squibb	PWSID #:									H										SCR#:
Project Manager: William McCune	P.O. #:																			Preservation Codes: H=HCl, N=HNO_3, S=H_2SO_4, F=Field Filtered, T=Thiosulfate, B=NaOH, P=H_3PO_4, O=Other
Sampler: Joshua Miller	Quote #:																			Remarks
State where samples were collected: NY	For Compliance: Yes [ ] No [X]																			

Sample Identification	Collected Date	Collected Time	Grab	Composite																	
B55-PDI-SB-21	11/17/20	1350	X				X		6				X	X	X						
B55-PDI-SB-17 (9-10)		1310		X			X		5	X	X	X									
B55-PDI-SB-19 (11.6-12.6)		1330		X			X		5	X	X	X									
B55-PDI-SB-18 (10.7-11.7)		1345		X			X		5	X	X	X									
B55-PDI-SB-19 (12.6-13.6)		1400		X			X		5	X	X	X									
B55-PDI-SB-18 (9.5-10.5)		1405		X			X		5	X	X	X									
B55-PDI-SB-21 (4.5-5.5)		1415		X			X		5	X	X	X									
B55-PDI-SB-17 (8-9)		1430		X			X		5	X	X	X									
B55-PDI-SB-06 (12-13)	↓	1445		X			X		5	X	X	X									
TB 20083	LAB PROVIDED		X				X		1				X								

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Date Collected is 11/16/20

Date Collected is 11/11/20

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: STANDARD

E-mail address: William.McCune@arcads.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	11/17/20	1450			
				11/18/20	1146
				11/18/2020	1146

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.1 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • FOR HELP COMPLETING FORM CHECK OUT https://www.eurofinsus.com/coc

The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919

Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 410-21255-1

Login Number: 21255
List Number: 1
Creator: Rivera, Tatiana

List Source: Eurofins Lancaster Laboratories Env

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Received extra samples not listed on COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	True	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-21427-1
Client Project/Site: Bristol-Myers Squibb
Revision: 1

For:
ARCADIS U.S. Inc
One Lincoln Center
110 West Fayette St, Suite 300
Syracuse, New York 13202

Attn: William T McCune

Authorized for release by:
12/30/2020 5:24:24 PM

Megan Moeller, Client Services Group Leader
(717)556-7261
Megan.Moeller@eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

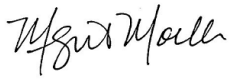
Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



Megan Moeller
Client Services Group Leader
12/30/2020 5:24:24 PM

Table of Contents

Cover Page 1
Table of Contents 3
Definitions/Glossary 4
Case Narrative 6
Detection Summary 7
Client Sample Results 12
Surrogate Summary 59
QC Sample Results 63
QC Association Summary 100
Lab Chronicle 104
Certification Summary 108
Method Summary 109
Sample Summary 110
Chain of Custody 111
Receipt Checklists 113

Definitions/Glossary

Client: ARCADIS U.S. Inc
Job ID: 410-21427-1
Project/Site: Bristol-Myers Squibb

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*1	LCS/LCSD RPD exceeds control limits.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-21427-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-21427-1

Revision
The report being provided is a revision of the original report sent on 12/11/2020. The report (revision 1) is being revised due to: Add 1,4-Dioxane.

Receipt
The samples were received on 11/19/2020 11:18 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.3º C.

GC/MS VOA
Method 8260C: The continuing calibration verification (CCV) associated with batch 410-69809 recovered above the upper control limit for 1,4-Dioxane. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: The continuing calibration verification (CCV) associated with batch 410-70130 recovered above the upper control limit for 2-Nitropropane, Bromoform, cis-1,3-Dichloropropene and Bromodichloromethane. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: Surrogate recovery for the following samples in analytical batch 410-70130 was outside control limits: B55-PDI-SB-10 (9-10) (410-21427-10) and DUP111820 (410-21427-11). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270D: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 410-68893 recovered outside control limits for the following analytes: Triethylamine. The stated control limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Method 8270D: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch <PrepBatch> recovered outside control limits for the following analytes: Dicyclohexylamine. The stated control limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

HPLC/IC
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: EB111820W — Lab Sample ID: 410-21427-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	1.4	J	20	0.70	ug/L	1		8260C	Total/NA

Client Sample ID: B55-PDI-SB-03 — Lab Sample ID: 410-21427-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	4.2	J	5.0	1.0	ug/L	1		8260C	Total/NA
1,3,5-Trimethylbenzene	0.93	J	5.0	0.30	ug/L	1		8260C	Total/NA
Chloroform	2.1		1.0	0.20	ug/L	1		8260C	Total/NA
Cyclohexane	1.6	J	5.0	1.0	ug/L	1		8260C	Total/NA
Ethylbenzene	1.2		1.0	0.40	ug/L	1		8260C	Total/NA
Isopropylbenzene	0.23	J	5.0	0.20	ug/L	1		8260C	Total/NA
m&p-Xylene	2.2	J	5.0	1.0	ug/L	1		8260C	Total/NA
Methylcyclohexane	0.72	J	5.0	0.50	ug/L	1		8260C	Total/NA
o-Xylene	0.73	J	1.0	0.40	ug/L	1		8260C	Total/NA
Xylenes, Total	2.9	J	6.0	1.4	ug/L	1		8260C	Total/NA
Naphthalene	0.23	J	0.52	0.10	ug/L	1		8270D	Total/NA

Client Sample ID: B55-PDI-SB-04 — Lab Sample ID: 410-21427-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,2-Trichloroethane	26		1.0	0.20	ug/L	1		8260C	Total/NA
1,2-Dichloropropane	4.0		1.0	0.20	ug/L	1		8260C	Total/NA
1,3,5-Trimethylbenzene	300		5.0	0.30	ug/L	1		8260C	Total/NA
Acetone	16	J	20	0.70	ug/L	1		8260C	Total/NA
Benzene	0.93	J	1.0	0.20	ug/L	1		8260C	Total/NA
Carbon disulfide	0.29	J	5.0	0.20	ug/L	1		8260C	Total/NA
Isopropylbenzene	82		5.0	0.20	ug/L	1		8260C	Total/NA
Methylcyclohexane	220		5.0	0.50	ug/L	1		8260C	Total/NA
Naphthalene	170		5.0	1.0	ug/L	1		8260C	Total/NA
n-Butylbenzene	30		5.0	0.20	ug/L	1		8260C	Total/NA
n-Heptane	37		5.0	2.0	ug/L	1		8260C	Total/NA
o-Xylene	280		1.0	0.40	ug/L	1		8260C	Total/NA
p-Isopropyltoluene	7.0		5.0	0.20	ug/L	1		8260C	Total/NA
sec-Butylbenzene	12		5.0	0.20	ug/L	1		8260C	Total/NA
tert-Butylbenzene	0.59	J	5.0	0.30	ug/L	1		8260C	Total/NA
Toluene	9.9		1.0	0.20	ug/L	1		8260C	Total/NA
1,2,4-Trimethylbenzene - DL	1200		50	10	ug/L	10		8260C	Total/NA
Cyclohexane - DL	330		50	10	ug/L	10		8260C	Total/NA
Ethylbenzene - DL	320		10	4.0	ug/L	10		8260C	Total/NA
m&p-Xylene - DL	580		50	10	ug/L	10		8260C	Total/NA
Xylenes, Total - DL	800		60	14	ug/L	10		8260C	Total/NA
2-Methylnaphthalene	46		0.64	0.13	ug/L	1		8270D	Total/NA
3,4-Methylphenol	3.5		2.5	0.64	ug/L	1		8270D	Total/NA
Acenaphthene	1.4		0.64	0.13	ug/L	1		8270D	Total/NA
Anthracene	0.66		0.64	0.13	ug/L	1		8270D	Total/NA
Benzo[a]anthracene	0.41	J	0.64	0.13	ug/L	1		8270D	Total/NA
Benzo[a]pyrene	0.37	J	0.64	0.13	ug/L	1		8270D	Total/NA
Benzo[b]fluoranthene	0.41	J	0.64	0.13	ug/L	1		8270D	Total/NA
Benzo[g,h,i]perylene	0.21	J	0.64	0.13	ug/L	1		8270D	Total/NA
Benzo[k]fluoranthene	0.20	J	0.64	0.13	ug/L	1		8270D	Total/NA
Carbazole	2.1	J	2.5	0.64	ug/L	1		8270D	Total/NA
Chrysene	0.42	J	0.64	0.13	ug/L	1		8270D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: B55-PDI-SB-04 (Continued) — Lab Sample ID: 410-21427-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dibenzofuran	1.1	J	2.5	0.64	ug/L	1		8270D	Total/NA
Fluoranthene	1.3		0.64	0.13	ug/L	1		8270D	Total/NA
Fluorene	1.5		0.64	0.13	ug/L	1		8270D	Total/NA
Hexachlorobenzene	0.46	J	0.64	0.13	ug/L	1		8270D	Total/NA
Indeno[1,2,3-cd]pyrene	0.23	J	0.64	0.13	ug/L	1		8270D	Total/NA
Naphthalene	51		0.64	0.13	ug/L	1		8270D	Total/NA
Phenanthrene	2.7		0.64	0.13	ug/L	1		8270D	Total/NA
Pyrene	1.0		0.64	0.13	ug/L	1		8270D	Total/NA
Dicyclohexylamine - DL	1100	*- *1	250	130	ug/L	10		8270D	Total/NA
Formaldehyde	30	J	50	20	ug/L	1		8315A	Total/NA

Client Sample ID: B55-PDI-SB-05 — Lab Sample ID: 410-21427-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	7.4		5.0	1.0	ug/L	1		8260C	Total/NA
1,3,5-Trimethylbenzene	1.6	J	5.0	0.30	ug/L	1		8260C	Total/NA
Acetone	1.9	J	20	0.70	ug/L	1		8260C	Total/NA
Carbon disulfide	0.25	J	5.0	0.20	ug/L	1		8260C	Total/NA
Chloroform	0.61	J	1.0	0.20	ug/L	1		8260C	Total/NA
Cyclohexane	2.9	J	5.0	1.0	ug/L	1		8260C	Total/NA
Ethylbenzene	2.5		1.0	0.40	ug/L	1		8260C	Total/NA
Isopropylbenzene	0.48	J	5.0	0.20	ug/L	1		8260C	Total/NA
m&p-Xylene	4.5	J	5.0	1.0	ug/L	1		8260C	Total/NA
Methylcyclohexane	1.2	J	5.0	0.50	ug/L	1		8260C	Total/NA
Naphthalene	1.7	J	5.0	1.0	ug/L	1		8260C	Total/NA
o-Xylene	1.7		1.0	0.40	ug/L	1		8260C	Total/NA
Toluene	0.23	J	1.0	0.20	ug/L	1		8260C	Total/NA
Xylenes, Total	6.2		6.0	1.4	ug/L	1		8260C	Total/NA

Client Sample ID: B55-PDI-SB-07 — Lab Sample ID: 410-21427-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	13		5.0	1.0	ug/L	1		8260C	Total/NA
1,3,5-Trimethylbenzene	2.8	J	5.0	0.30	ug/L	1		8260C	Total/NA
Acetone	1.4	J	20	0.70	ug/L	1		8260C	Total/NA
Cyclohexane	4.6	J	5.0	1.0	ug/L	1		8260C	Total/NA
Ethylbenzene	3.1		1.0	0.40	ug/L	1		8260C	Total/NA
Isopropylbenzene	0.64	J	5.0	0.20	ug/L	1		8260C	Total/NA
m&p-Xylene	6.0		5.0	1.0	ug/L	1		8260C	Total/NA
Methylcyclohexane	2.3	J	5.0	0.50	ug/L	1		8260C	Total/NA
Naphthalene	1.6	J	5.0	1.0	ug/L	1		8260C	Total/NA
n-Butylbenzene	0.20	J	5.0	0.20	ug/L	1		8260C	Total/NA
o-Xylene	2.0		1.0	0.40	ug/L	1		8260C	Total/NA
Xylenes, Total	8.0		6.0	1.4	ug/L	1		8260C	Total/NA

Client Sample ID: B55-PDI-SB-15 — Lab Sample ID: 410-21427-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	10		5.0	1.0	ug/L	1		8260C	Total/NA
1,3,5-Trimethylbenzene	2.2	J	5.0	0.30	ug/L	1		8260C	Total/NA
Acetone	8.9	J	20	0.70	ug/L	1		8260C	Total/NA
Carbon disulfide	0.39	J	5.0	0.20	ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: B55-PDI-SB-15 (Continued)

Lab Sample ID: 410-21427-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	0.56	J	1.0	0.20	ug/L	1		8260C	Total/NA
Ethylbenzene	2.5		1.0	0.40	ug/L	1		8260C	Total/NA
Isopropylbenzene	0.55	J	5.0	0.20	ug/L	1		8260C	Total/NA
m&p-Xylene	4.6	J	5.0	1.0	ug/L	1		8260C	Total/NA
Methylcyclohexane	1.7	J	5.0	0.50	ug/L	1		8260C	Total/NA
Naphthalene	1.3	J	5.0	1.0	ug/L	1		8260C	Total/NA
o-Xylene	1.6		1.0	0.40	ug/L	1		8260C	Total/NA
Toluene	0.21	J	1.0	0.20	ug/L	1		8260C	Total/NA
Xylenes, Total	6.2		6.0	1.4	ug/L	1		8260C	Total/NA
Fluoranthene	0.17	J	0.60	0.12	ug/L	1		8270D	Total/NA
Pyrene	0.16	J	0.60	0.12	ug/L	1		8270D	Total/NA

Client Sample ID: B55-PDI-SB-16

Lab Sample ID: 410-21427-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	6.3		5.0	1.0	ug/L	1		8260C	Total/NA
1,3,5-Trimethylbenzene	1.4	J	5.0	0.30	ug/L	1		8260C	Total/NA
Acetone	1.9	J	20	0.70	ug/L	1		8260C	Total/NA
Cyclohexane	1.6	J	5.0	1.0	ug/L	1		8260C	Total/NA
Ethylbenzene	1.5		1.0	0.40	ug/L	1		8260C	Total/NA
Isopropylbenzene	0.29	J	5.0	0.20	ug/L	1		8260C	Total/NA
m&p-Xylene	2.8	J	5.0	1.0	ug/L	1		8260C	Total/NA
Methylcyclohexane	1.0	J	5.0	0.50	ug/L	1		8260C	Total/NA
o-Xylene	0.93	J	1.0	0.40	ug/L	1		8260C	Total/NA
Xylenes, Total	3.7	J	6.0	1.4	ug/L	1		8260C	Total/NA
Anthracene	1.7	J	5.3	1.1	ug/L	10		8270D	Total/NA
Benzo[a]anthracene	7.6		5.3	1.1	ug/L	10		8270D	Total/NA
Benzo[a]pyrene	9.2		5.3	1.1	ug/L	10		8270D	Total/NA
Benzo[b]fluoranthene	10		5.3	1.1	ug/L	10		8270D	Total/NA
Benzo[g,h,i]perylene	5.0	J	5.3	1.1	ug/L	10		8270D	Total/NA
Benzo[k]fluoranthene	4.6	J	5.3	1.1	ug/L	10		8270D	Total/NA
Chrysene	8.9		5.3	1.1	ug/L	10		8270D	Total/NA
Fluoranthene	13		5.3	1.1	ug/L	10		8270D	Total/NA
Indeno[1,2,3-cd]pyrene	5.0	J	5.3	1.1	ug/L	10		8270D	Total/NA
Naphthalene	1.4	J	5.3	1.1	ug/L	10		8270D	Total/NA
Phenanthrene	7.1		5.3	1.1	ug/L	10		8270D	Total/NA
Pyrene	15		5.3	1.1	ug/L	10		8270D	Total/NA
Bis(2-ethylhexyl) phthalate	56	J	120	53	ug/L	10		8270D	Total/NA

Client Sample ID: B55-PDI-SB-18

Lab Sample ID: 410-21427-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	7.1		5.0	1.0	ug/L	1		8260C	Total/NA
1,2-Dichloropropane	0.47	J	1.0	0.20	ug/L	1		8260C	Total/NA
1,3,5-Trimethylbenzene	4.4	J	5.0	0.30	ug/L	1		8260C	Total/NA
2-Butanone	11		10	0.30	ug/L	1		8260C	Total/NA
4-Methyl-2-pentanone	0.52	J	10	0.50	ug/L	1		8260C	Total/NA
Acetone	18	J	20	0.70	ug/L	1		8260C	Total/NA
Benzene	0.51	J	1.0	0.20	ug/L	1		8260C	Total/NA
Carbon disulfide	0.34	J	5.0	0.20	ug/L	1		8260C	Total/NA
Cyclohexane	13		5.0	1.0	ug/L	1		8260C	Total/NA
Ethylbenzene	5.4		1.0	0.40	ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: B55-PDI-SB-18 (Continued) — Lab Sample ID: 410-21427-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Isopropylbenzene	2.2	J	5.0	0.20	ug/L	1		8260C	Total/NA
m&p-Xylene	7.8		5.0	1.0	ug/L	1		8260C	Total/NA
Methylcyclohexane	26		5.0	0.50	ug/L	1		8260C	Total/NA
Naphthalene	2.6	J	5.0	1.0	ug/L	1		8260C	Total/NA
n-Butylbenzene	2.0	J	5.0	0.20	ug/L	1		8260C	Total/NA
n-Heptane	9.6		5.0	2.0	ug/L	1		8260C	Total/NA
o-Xylene	3.4		1.0	0.40	ug/L	1		8260C	Total/NA
p-Isopropyltoluene	0.58	J	5.0	0.20	ug/L	1		8260C	Total/NA
sec-Butylbenzene	1.1	J	5.0	0.20	ug/L	1		8260C	Total/NA
Toluene	0.51	J	1.0	0.20	ug/L	1		8260C	Total/NA
Xylenes, Total	11		6.0	1.4	ug/L	1		8260C	Total/NA
Anthracene	0.23	J	0.52	0.10	ug/L	1		8270D	Total/NA
Benzo[a]anthracene	0.20	J	0.52	0.10	ug/L	1		8270D	Total/NA
Benzo[a]pyrene	0.21	J	0.52	0.10	ug/L	1		8270D	Total/NA
Benzo[b]fluoranthene	0.20	J	0.52	0.10	ug/L	1		8270D	Total/NA
Benzo[k]fluoranthene	0.13	J	0.52	0.10	ug/L	1		8270D	Total/NA
Chrysene	0.27	J	0.52	0.10	ug/L	1		8270D	Total/NA
Fluoranthene	0.53		0.52	0.10	ug/L	1		8270D	Total/NA
Phenanthrene	0.24	J	0.52	0.10	ug/L	1		8270D	Total/NA
Pyrene	0.46	J	0.52	0.10	ug/L	1		8270D	Total/NA

Client Sample ID: B55-PDI-SB-22 (5.2-6.2) — Lab Sample ID: 410-21427-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone	0.0020	J	0.0092	0.0018	mg/Kg	1	☼	8260C	Total/NA
Acetone	0.028	F1	0.018	0.0055	mg/Kg	1	☼	8260C	Total/NA
Carbon disulfide	0.00070	J	0.0046	0.00055	mg/Kg	1	☼	8260C	Total/NA
2-Methylnaphthalene	0.0042	J	0.041	0.0041	mg/Kg	1	☼	8270D	Total/NA
Fluoranthene	0.0089	J	0.020	0.0041	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.011	J	0.020	0.0041	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	24		12	4.1	mg/Kg	5	☼	8270D	Total/NA
Formaldehyde	0.11		0.092	0.031	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: B55-PDI-SB-10 (9-10) — Lab Sample ID: 410-21427-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.68		0.30	0.024	mg/Kg	50	☼	8260C	Total/NA
m&p-Xylene	1.0		0.30	0.061	mg/Kg	50	☼	8260C	Total/NA
o-Xylene	0.14	J	0.30	0.024	mg/Kg	50	☼	8260C	Total/NA
Isopropylbenzene	2.3		0.30	0.024	mg/Kg	50	☼	8260C	Total/NA
Naphthalene	0.26	J	0.30	0.12	mg/Kg	50	☼	8260C	Total/NA
n-Butylbenzene	10		0.49	0.18	mg/Kg	50	☼	8260C	Total/NA
n-Heptane	6.1		0.49	0.18	mg/Kg	50	☼	8260C	Total/NA
p-Isopropyltoluene	2.1		0.30	0.12	mg/Kg	50	☼	8260C	Total/NA
sec-Butylbenzene	3.6		0.30	0.12	mg/Kg	50	☼	8260C	Total/NA
tert-Butylbenzene	0.090	J	0.30	0.049	mg/Kg	50	☼	8260C	Total/NA
Xylenes, Total	1.1		0.61	0.085	mg/Kg	50	☼	8260C	Total/NA
Methylcyclohexane - DL	58		3.0	0.37	mg/Kg	500	☼	8260C	Total/NA
1,2,4-Trimethylbenzene - DL	47		3.0	0.30	mg/Kg	500	☼	8260C	Total/NA
1,1'-Biphenyl	0.053		0.047	0.021	mg/Kg	1	☼	8270D	Total/NA
Anthracene	0.018	J	0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA
Fluorene	0.036		0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: B55-PDI-SB-10 (9-10) (Continued) — Lab Sample ID: 410-21427-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Phenanthrene	0.084		0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.025		0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	21		13	4.2	mg/Kg	5	☼	8270D	Total/NA
Formaldehyde	0.27		0.096	0.032	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: DUP111820 — Lab Sample ID: 410-21427-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.95		0.30	0.024	mg/Kg	50	☼	8260C	Total/NA
m&p-Xylene	1.2		0.30	0.059	mg/Kg	50	☼	8260C	Total/NA
o-Xylene	0.16	J	0.30	0.024	mg/Kg	50	☼	8260C	Total/NA
Isopropylbenzene	2.0		0.30	0.024	mg/Kg	50	☼	8260C	Total/NA
Naphthalene	0.31		0.30	0.12	mg/Kg	50	☼	8260C	Total/NA
n-Butylbenzene	10		0.47	0.18	mg/Kg	50	☼	8260C	Total/NA
n-Heptane	4.0		0.47	0.18	mg/Kg	50	☼	8260C	Total/NA
p-Isopropyltoluene	2.3		0.30	0.12	mg/Kg	50	☼	8260C	Total/NA
sec-Butylbenzene	3.8		0.30	0.12	mg/Kg	50	☼	8260C	Total/NA
tert-Butylbenzene	0.087	J	0.30	0.047	mg/Kg	50	☼	8260C	Total/NA
Xylenes, Total	1.4		0.59	0.083	mg/Kg	50	☼	8260C	Total/NA
Methylcyclohexane - DL	48		3.0	0.35	mg/Kg	500	☼	8260C	Total/NA
1,2,4-Trimethylbenzene - DL	38		3.0	0.30	mg/Kg	500	☼	8260C	Total/NA
Benzo[a]pyrene	0.0057	J	0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA
Benzo[b]fluoranthene	0.0074	J	0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA
Bis(2-ethylhexyl) phthalate	0.31		0.21	0.083	mg/Kg	1	☼	8270D	Total/NA
Chrysene	0.0094	J	0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA
Fluoranthene	0.010	J	0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA
Fluorene	0.026		0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA
Phenanthrene	0.061		0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.022		0.021	0.0042	mg/Kg	1	☼	8270D	Total/NA
Dicyclohexylamine - DL	23		12	4.2	mg/Kg	5	☼	8270D	Total/NA
Acetaldehyde	0.036	J	0.063	0.032	mg/Kg	1	☼	8315A	Total/NA
Formaldehyde	1.2		0.095	0.032	mg/Kg	1	☼	8315A	Total/NA

Client Sample ID: TB20308 — Lab Sample ID: 410-21427-12

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: EB111820W
Date Collected: 11/18/20 08:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-1
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 13:21	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 13:21	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 13:21	1
1,2,4-Trimethylbenzene	ND		5.0	1.0	ug/L			12/01/20 13:21	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 13:21	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 13:21	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,3,5-Trimethylbenzene	ND		5.0	0.30	ug/L			12/01/20 13:21	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 13:21	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 13:21	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 13:21	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 13:21	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 13:21	1
Acetone	**1.4**	**J**	20	0.70	ug/L			12/01/20 13:21	1
Acetonitrile	ND		100	16	ug/L			12/01/20 13:21	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 13:21	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 13:21	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 13:21	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 13:21	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 13:21	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Cyclohexane	ND		5.0	1.0	ug/L			12/01/20 13:21	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 13:21	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 13:21	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 13:21	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/01/20 13:21	1
Freon 113	ND		10	0.20	ug/L			12/01/20 13:21	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 13:21	1
Isopropylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
m&p-Xylene	ND		5.0	1.0	ug/L			12/01/20 13:21	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 13:21	1

Client Sample ID: EB111820W

Date Collected: 11/18/20 08:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-1

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Methylcyclohexane	ND		5.0	0.50	ug/L			12/01/20 13:21	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 13:21	1
Naphthalene	ND		5.0	1.0	ug/L			12/01/20 13:21	1
n-Butanol	ND		250	61	ug/L			12/01/20 13:21	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 13:21	1
o-Xylene	ND		1.0	0.40	ug/L			12/01/20 13:21	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 13:21	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 13:21	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 13:21	1
Toluene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Xylenes, Total	ND		6.0	1.4	ug/L			12/01/20 13:21	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 13:21*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/20 13:21*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*12/01/20 13:21*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*12/01/20 13:21*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*12/01/20 13:21*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
1,2,4,5-Tetrachlorobenzene	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,2'-oxybis[1-chloropropane]	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,3,4,6-Tetrachlorophenol	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4,5-Trichlorophenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4,6-Trichlorophenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4-Dichlorophenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4-Dimethylphenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4-Dinitrophenol	ND		31	14	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4-Dinitrotoluene	ND		5.1	1.0	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,6-Dinitrotoluene	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2-Chloronaphthalene	ND		1.0	0.41	ug/L		11/25/20 10:15	12/02/20 06:06	1
2-Chlorophenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2-Methylnaphthalene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
2-Methylphenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2-Nitroaniline	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: EB111820W
Date Collected: 11/18/20 08:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-1
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
3,3'-Dichlorobenzidine	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
3-Nitroaniline	ND		7.2	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
4,6-Dinitro-2-methylphenol	ND		22	8.2	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Bromophenyl-phenylether	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Chloro-3-methylphenol	ND		3.6	1.6	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Chloroaniline	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Chlorophenyl-phenyl ether	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
3,4-Methylphenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Nitroaniline	ND		3.1	0.92	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Nitrophenol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Acenaphthene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Acenaphthylene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Acetophenone	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Aniline	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Anthracene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Atrazine	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzaldehyde	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzo[a]anthracene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzo[a]pyrene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzo[b]fluoranthene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzo[g,h,i]perylene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzo[k]fluoranthene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzyl alcohol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Butylbenzylphthalate	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Caprolactam	ND		11	5.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Carbazole	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Chrysene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Di-n-butyl phthalate	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Di-n-octyl phthalate	ND		11	5.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Dibenz(a,h)anthracene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Dibenzofuran	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Dicyclohexylamine	ND	*- *1	21	10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Diethyl phthalate	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Dimethyl phthalate	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Fluoranthene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Fluorene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Hexachlorobenzene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Hexachlorobutadiene	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Hexachlorocyclopentadiene	ND		11	5.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Hexachloroethane	ND		5.1	1.0	ug/L		11/25/20 10:15	12/02/20 06:06	1
Indeno[1,2,3-cd]pyrene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Isophorone	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
n,n'-Dimethylaniline	ND		1.0	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
N-Nitrosodi-n-propylamine	ND		3.1	0.72	ug/L		11/25/20 10:15	12/02/20 06:06	1
N-Nitrosodiphenylamine	ND		3.1	0.72	ug/L		11/25/20 10:15	12/02/20 06:06	1
Naphthalene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Nitrobenzene	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Pentachlorophenol	ND		5.1	1.0	ug/L		11/25/20 10:15	12/02/20 06:06	1

Client Sample ID: EB111820W

Date Collected: 11/18/20 08:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-1
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenanthrene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Phenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Pyrene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Pyridine	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Triethylamine	ND		10	10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Bis(2-chloroethoxy)methane	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Bis(2-chloroethyl)ether	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Bis(2-ethylhexyl) phthalate	ND		11	5.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
1,4-Dioxane	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*11/25/20 10:15*	*12/02/20 06:06*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*83*		*10 - 150*	*11/25/20 10:15*	*12/02/20 06:06*	*1*
2-Fluorobiphenyl (Surr)	*74*		*44 - 102*	*11/25/20 10:15*	*12/02/20 06:06*	*1*
2-Fluorophenol (Surr)	*48*		*10 - 84*	*11/25/20 10:15*	*12/02/20 06:06*	*1*
Nitrobenzene-d5 (Surr)	*75*		*23 - 128*	*11/25/20 10:15*	*12/02/20 06:06*	*1*
p-Terphenyl-d14 (Surr)	*87*		*31 - 113*	*11/25/20 10:15*	*12/02/20 06:06*	*1*
Phenol-d5 (Surr)	*36*		*10 - 67*	*11/25/20 10:15*	*12/02/20 06:06*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 20:16	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 20:16	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 20:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*98*		*39 - 153*	*11/20/20 16:15*	*11/23/20 20:16*	*1*

Client Sample ID: B55-PDI-SB-03

Date Collected: 11/18/20 08:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-2
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 16:40	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 16:40	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 16:40	1
1,2,4-Trimethylbenzene	**4.2**	**J**	5.0	1.0	ug/L			12/01/20 16:40	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 16:40	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 16:40	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,3,5-Trimethylbenzene	**0.93**	**J**	5.0	0.30	ug/L			12/01/20 16:40	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 16:40	1

Client Sample ID: B55-PDI-SB-03
Date Collected: 11/18/20 08:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-2
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 16:40	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 16:40	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 16:40	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 16:40	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 16:40	1
Acetone	ND		20	0.70	ug/L			12/01/20 16:40	1
Acetonitrile	ND		100	16	ug/L			12/01/20 16:40	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 16:40	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 16:40	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 16:40	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 16:40	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 16:40	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Chloroform	**2.1**		1.0	0.20	ug/L			12/01/20 16:40	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Cyclohexane	**1.6**	**J**	5.0	1.0	ug/L			12/01/20 16:40	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 16:40	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 16:40	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 16:40	1
Ethylbenzene	**1.2**		1.0	0.40	ug/L			12/01/20 16:40	1
Freon 113	ND		10	0.20	ug/L			12/01/20 16:40	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 16:40	1
Isopropylbenzene	**0.23**	**J**	5.0	0.20	ug/L			12/01/20 16:40	1
m&p-Xylene	**2.2**	**J**	5.0	1.0	ug/L			12/01/20 16:40	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 16:40	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Methylcyclohexane	**0.72**	**J**	5.0	0.50	ug/L			12/01/20 16:40	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 16:40	1
Naphthalene	ND		5.0	1.0	ug/L			12/01/20 16:40	1
n-Butanol	ND		250	61	ug/L			12/01/20 16:40	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 16:40	1
o-Xylene	**0.73**	**J**	1.0	0.40	ug/L			12/01/20 16:40	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 16:40	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 16:40	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 16:40	1

Client Sample ID: B55-PDI-SB-03
Date Collected: 11/18/20 08:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-2
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Xylenes, Total	**2.9**	**J**	6.0	1.4	ug/L			12/01/20 16:40	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 16:40*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/20 16:40*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*12/01/20 16:40*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*12/01/20 16:40*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 16:40*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
1,2,4,5-Tetrachlorobenzene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,2'-oxybis[1-chloropropane]	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,3,4,6-Tetrachlorophenol	ND		10	4.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4,5-Trichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4,6-Trichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4-Dichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4-Dimethylphenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4-Dinitrophenol	ND		31	15	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4-Dinitrotoluene	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,6-Dinitrotoluene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Chloronaphthalene	ND		1.0	0.42	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Chlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Methylnaphthalene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Methylphenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Nitroaniline	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Nitrophenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
3,3'-Dichlorobenzidine	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
3-Nitroaniline	ND		7.3	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
4,6-Dinitro-2-methylphenol	ND		22	8.3	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Bromophenyl-phenylether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Chloro-3-methylphenol	ND		3.6	1.7	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Chloroaniline	ND		10	4.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Chlorophenyl-phenyl ether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
3,4-Methylphenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Nitroaniline	ND		3.1	0.94	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Nitrophenol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Acenaphthene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Acenaphthylene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Acetophenone	ND		10	4.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
Aniline	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1

Client Sample ID: B55-PDI-SB-03
Date Collected: 11/18/20 08:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-2
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anthracene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Atrazine	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzaldehyde	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzo[a]anthracene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzo[a]pyrene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzo[b]fluoranthene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzo[g,h,i]perylene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzo[k]fluoranthene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzyl alcohol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Butylbenzylphthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Caprolactam	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
Carbazole	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Chrysene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Di-n-butyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Di-n-octyl phthalate	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
Dibenz(a,h)anthracene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Dibenzofuran	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Dicyclohexylamine	ND	*- *1	21	10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Diethyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Dimethyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Fluoranthene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Fluorene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Hexachlorobenzene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Hexachlorobutadiene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Hexachlorocyclopentadiene	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
Hexachloroethane	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 06:34	1
Indeno[1,2,3-cd]pyrene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Isophorone	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
n,n'-Dimethylaniline	ND		1.0	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
N-Nitrosodi-n-propylamine	ND		3.1	0.73	ug/L		11/25/20 10:15	12/02/20 06:34	1
N-Nitrosodiphenylamine	ND		3.1	0.73	ug/L		11/25/20 10:15	12/02/20 06:34	1
Naphthalene	**0.23**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Nitrobenzene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Pentachlorophenol	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 06:34	1
Phenanthrene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Phenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Pyrene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Pyridine	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Triethylamine	ND		10	10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Bis(2-chloroethoxy)methane	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Bis(2-chloroethyl)ether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Bis(2-ethylhexyl) phthalate	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
1,4-Dioxane	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*5.0*	*T J*	*ug/L*		*18.69*		*11/25/20 10:15*	*12/02/20 06:34*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*85*		*10 - 150*	*11/25/20 10:15*	*12/02/20 06:34*	*1*
2-Fluorobiphenyl (Surr)	*78*		*44 - 102*	*11/25/20 10:15*	*12/02/20 06:34*	*1*

Client Sample ID: B55-PDI-SB-03

Date Collected: 11/18/20 08:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-2

Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*53*		*10 - 84*	*11/25/20 10:15*	*12/02/20 06:34*	*1*
Nitrobenzene-d5 (Surr)	*79*		*23 - 128*	*11/25/20 10:15*	*12/02/20 06:34*	*1*
p-Terphenyl-d14 (Surr)	*59*		*31 - 113*	*11/25/20 10:15*	*12/02/20 06:34*	*1*
Phenol-d5 (Surr)	*40*		*10 - 67*	*11/25/20 10:15*	*12/02/20 06:34*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 20:27	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 20:27	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 20:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*102*		*39 - 153*	*11/20/20 16:15*	*11/23/20 20:27*	*1*

Client Sample ID: B55-PDI-SB-04

Date Collected: 11/18/20 08:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-3

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 17:02	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
1,1,2-Trichloroethane	**26**		1.0	0.20	ug/L			12/01/20 17:02	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 17:02	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 17:02	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 17:02	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:02	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 17:02	1
1,2-Dichloropropane	**4.0**		1.0	0.20	ug/L			12/01/20 17:02	1
1,3,5-Trimethylbenzene	**300**		5.0	0.30	ug/L			12/01/20 17:02	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:02	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:02	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 17:02	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 17:02	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 17:02	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 17:02	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 17:02	1
Acetone	**16**	**J**	20	0.70	ug/L			12/01/20 17:02	1
Acetonitrile	ND		100	16	ug/L			12/01/20 17:02	1
Benzene	**0.93**	**J**	1.0	0.20	ug/L			12/01/20 17:02	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 17:02	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 17:02	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 17:02	1
Carbon disulfide	**0.29**	**J**	5.0	0.20	ug/L			12/01/20 17:02	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 17:02	1

Client Sample ID: B55-PDI-SB-04
Date Collected: 11/18/20 08:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-3
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 17:02	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 17:02	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 17:02	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 17:02	1
Freon 113	ND		10	0.20	ug/L			12/01/20 17:02	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 17:02	1
Isopropylbenzene	**82**		5.0	0.20	ug/L			12/01/20 17:02	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 17:02	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Methylcyclohexane	**220**		5.0	0.50	ug/L			12/01/20 17:02	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 17:02	1
Naphthalene	**170**		5.0	1.0	ug/L			12/01/20 17:02	1
n-Butanol	ND		250	61	ug/L			12/01/20 17:02	1
n-Butylbenzene	**30**		5.0	0.20	ug/L			12/01/20 17:02	1
n-Heptane	**37**		5.0	2.0	ug/L			12/01/20 17:02	1
o-Xylene	**280**		1.0	0.40	ug/L			12/01/20 17:02	1
p-Isopropyltoluene	**7.0**		5.0	0.20	ug/L			12/01/20 17:02	1
sec-Butylbenzene	**12**		5.0	0.20	ug/L			12/01/20 17:02	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 17:02	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 17:02	1
tert-Butylbenzene	**0.59**	**J**	5.0	0.30	ug/L			12/01/20 17:02	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 17:02	1
Toluene	**9.9**		1.0	0.20	ug/L			12/01/20 17:02	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 17:02	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Butane, 2-methyl-	*420*	*T J N*	*ug/L*		*2.91*	*78-78-4*		*12/01/20 17:02*	*1*
Pentane	*230*	*T J N*	*ug/L*		*3.13*	*109-66-0*		*12/01/20 17:02*	*1*
Cyclopentane, methyl-	*370*	*T J N*	*ug/L*		*6.13*	*96-37-7*		*12/01/20 17:02*	*1*
Benzene, propyl-	*190*	*T J N*	*ug/L*		*12.47*	*103-65-1*		*12/01/20 17:02*	*1*
Benzene, 1-ethyl-2-methyl-	*460*	*T J N*	*ug/L*		*12.53*	*611-14-3*		*12/01/20 17:02*	*1*
Benzene, 1,2,3-trimethyl-	*350*	*T J N*	*ug/L*		*12.56*	*526-73-8*		*12/01/20 17:02*	*1*
Benzene, 1-ethyl-3-methyl-	*360*	*T J N*	*ug/L*		*12.75*	*620-14-4*		*12/01/20 17:02*	*1*
Benzene, cyclopropyl-	*310*	*T J N*	*ug/L*		*13.35*	*873-49-4*		*12/01/20 17:02*	*1*
Benzene, 1-ethyl-2,3-dimethyl-	*180*	*T J N*	*ug/L*		*13.65*	*933-98-2*		*12/01/20 17:02*	*1*
3-Phenylbut-1-ene	*300*	*T J N*	*ug/L*		*14.27*	*934-10-1*		*12/01/20 17:02*	*1*

Client Sample ID: B55-PDI-SB-04
Date Collected: 11/18/20 08:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-3
Matrix: Groundwater

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*80 - 120*		*12/01/20 17:02*	*1*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*12/01/20 17:02*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 120*		*12/01/20 17:02*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 17:02*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	**1200**		50	10	ug/L			12/02/20 17:59	10
Cyclohexane	**330**		50	10	ug/L			12/02/20 17:59	10
Ethylbenzene	**320**		10	4.0	ug/L			12/02/20 17:59	10
m&p-Xylene	**580**		50	10	ug/L			12/02/20 17:59	10
Xylenes, Total	**800**		60	14	ug/L			12/02/20 17:59	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*12/02/20 17:59*	*10*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*12/02/20 17:59*	*10*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*12/02/20 17:59*	*10*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/02/20 17:59*	*10*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
1,2,4,5-Tetrachlorobenzene	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,2'-oxybis[1-chloropropane]	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,3,4,6-Tetrachlorophenol	ND		13	5.1	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4,5-Trichlorophenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4,6-Trichlorophenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4-Dichlorophenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4-Dimethylphenol	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4-Dinitrophenol	ND		38	18	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4-Dinitrotoluene	ND		6.4	1.3	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,6-Dinitrotoluene	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Chloronaphthalene	ND		1.3	0.51	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Chlorophenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Methylnaphthalene	**46**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Methylphenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Nitroaniline	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Nitrophenol	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
3,3'-Dichlorobenzidine	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
3-Nitroaniline	ND		8.9	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
4,6-Dinitro-2-methylphenol	ND		27	10	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Bromophenyl-phenylether	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Chloro-3-methylphenol	ND		4.5	2.0	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Chloroaniline	ND		13	5.1	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Chlorophenyl-phenyl ether	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
3,4-Methylphenol	**3.5**		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Nitroaniline	ND		3.8	1.1	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Nitrophenol	ND		38	13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Acenaphthene	**1.4**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Acenaphthylene	ND		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Acetophenone	ND		13	5.1	ug/L		11/25/20 10:15	12/02/20 07:02	1

Client Sample ID: B55-PDI-SB-04
Date Collected: 11/18/20 08:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-3
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aniline	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
Anthracene	**0.66**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Atrazine	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzaldehyde	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzo[a]anthracene	**0.41**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzo[a]pyrene	**0.37**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzo[b]fluoranthene	**0.41**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzo[g,h,i]perylene	**0.21**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzo[k]fluoranthene	**0.20**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzyl alcohol	ND		38	13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Butylbenzylphthalate	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Caprolactam	ND		14	6.4	ug/L		11/25/20 10:15	12/02/20 07:02	1
Carbazole	**2.1**	**J**	2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Chrysene	**0.42**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Di-n-butyl phthalate	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Di-n-octyl phthalate	ND		14	6.4	ug/L		11/25/20 10:15	12/02/20 07:02	1
Dibenz(a,h)anthracene	ND		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Dibenzofuran	**1.1**	**J**	2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Diethyl phthalate	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Dimethyl phthalate	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Fluoranthene	**1.3**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Fluorene	**1.5**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Hexachlorobenzene	**0.46**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Hexachlorobutadiene	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Hexachlorocyclopentadiene	ND		14	6.4	ug/L		11/25/20 10:15	12/02/20 07:02	1
Hexachloroethane	ND		6.4	1.3	ug/L		11/25/20 10:15	12/02/20 07:02	1
Indeno[1,2,3-cd]pyrene	**0.23**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Isophorone	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
n,n'-Dimethylaniline	ND		1.3	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
N-Nitrosodi-n-propylamine	ND		3.8	0.89	ug/L		11/25/20 10:15	12/02/20 07:02	1
N-Nitrosodiphenylamine	ND		3.8	0.89	ug/L		11/25/20 10:15	12/02/20 07:02	1
Naphthalene	**51**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Nitrobenzene	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Pentachlorophenol	ND		6.4	1.3	ug/L		11/25/20 10:15	12/02/20 07:02	1
Phenanthrene	**2.7**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Phenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Pyrene	**1.0**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Pyridine	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Triethylamine	ND		13	13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Bis(2-chloroethoxy)methane	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Bis(2-chloroethyl)ether	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Bis(2-ethylhexyl) phthalate	ND		14	6.4	ug/L		11/25/20 10:15	12/02/20 07:02	1
1,4-Dioxane	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Ethylbenzene	*150*	*T J N*	*ug/L*		*4.60*	*100-41-4*	*11/25/20 10:15*	*12/02/20 07:02*	*1*
p-Xylene	*200*	*T J N*	*ug/L*		*5.06*	*106-42-3*	*11/25/20 10:15*	*12/02/20 07:02*	*1*
Benzene, propyl-	*70*	*T J N*	*ug/L*		*5.89*	*103-65-1*	*11/25/20 10:15*	*12/02/20 07:02*	*1*
Benzene, (1-methylethyl)-	*440*	*T J N*	*ug/L*		*5.99*	*98-82-8*	*11/25/20 10:15*	*12/02/20 07:02*	*1*
Benzene, 1-ethyl-3-methyl-	*330*	*T J N*	*ug/L*		*6.04*	*620-14-4*	*11/25/20 10:15*	*12/02/20 07:02*	*1*

Client Sample ID: B55-PDI-SB-04

Date Collected: 11/18/20 08:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-3

Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Benzene, 1,2,3-trimethyl-	310	T J N	ug/L		6.10	526-73-8	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1-ethyl-4-methyl-	360	T J N	ug/L		6.21	622-96-8	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1,3,5-trimethyl-	810	T J N	ug/L		6.42	108-67-8	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1-ethyl-2-methyl-	420	T J N	ug/L		6.75	611-14-3	11/25/20 10:15	12/02/20 07:02	1
Indane	170	T J N	ug/L		6.92	496-11-7	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1,3-diethyl-	77	T J N	ug/L		7.05	141-93-5	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1-methyl-3-propyl-	110	T J N	ug/L		7.09	1074-43-7	11/25/20 10:15	12/02/20 07:02	1
Benzene, 4-ethyl-1,2-dimethyl-	250	T J N	ug/L		7.16	934-80-5	11/25/20 10:15	12/02/20 07:02	1
Benzene, 2-ethyl-1,4-dimethyl-	100	T J N	ug/L		7.37	1758-88-9	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1-methyl-4-(1-methylethyl)-	82	T J N	ug/L		7.41	99-87-6	11/25/20 10:15	12/02/20 07:02	1
Indan, 1-methyl-	140	T J N	ug/L		7.51	767-58-8	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1,2,4,5-tetramethyl-	120	T J N	ug/L		7.83	95-93-2	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1,2,3,4-tetramethyl-	150	T J N	ug/L		7.88	488-23-3	11/25/20 10:15	12/02/20 07:02	1
Benzene, 2-ethenyl-1,4-dimethyl-	170	T J N	ug/L		8.10	2039-89-6	11/25/20 10:15	12/02/20 07:02	1
Benzene, (2-methyl-1-propenyl)-	300	T J N	ug/L		8.20	768-49-0	11/25/20 10:15	12/02/20 07:02	1
Unknown	69	T J	ug/L		8.28		11/25/20 10:15	12/02/20 07:02	1
Naphthalene, 1,2,3,4-tetrahydro-	63	T J N	ug/L		8.35	119-64-2	11/25/20 10:15	12/02/20 07:02	1
Unknown	66	T J	ug/L		8.67		11/25/20 10:15	12/02/20 07:02	1
1H-Indene,2,3-dihydro-2,2-dimethyl-	59	T J N	ug/L		8.69	20836-11-7	11/25/20 10:15	12/02/20 07:02	1
Unknown	210	T J	ug/L		10.89		11/25/20 10:15	12/02/20 07:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	79		10 - 150	11/25/20 10:15	12/02/20 07:02	1
2-Fluorobiphenyl (Surr)	71		44 - 102	11/25/20 10:15	12/02/20 07:02	1
2-Fluorophenol (Surr)	54		10 - 84	11/25/20 10:15	12/02/20 07:02	1
Nitrobenzene-d5 (Surr)	76		23 - 128	11/25/20 10:15	12/02/20 07:02	1
p-Terphenyl-d14 (Surr)	43		31 - 113	11/25/20 10:15	12/02/20 07:02	1
Phenol-d5 (Surr)	45		10 - 67	11/25/20 10:15	12/02/20 07:02	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**1100**	*- *1	250	130	ug/L		11/25/20 10:15	12/02/20 17:10	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	79		10 - 150	11/25/20 10:15	12/02/20 17:10	10
2-Fluorobiphenyl (Surr)	85		44 - 102	11/25/20 10:15	12/02/20 17:10	10
2-Fluorophenol (Surr)	58		10 - 84	11/25/20 10:15	12/02/20 17:10	10
Nitrobenzene-d5 (Surr)	87		23 - 128	11/25/20 10:15	12/02/20 17:10	10
p-Terphenyl-d14 (Surr)	48		31 - 113	11/25/20 10:15	12/02/20 17:10	10
Phenol-d5 (Surr)	51		10 - 67	11/25/20 10:15	12/02/20 17:10	10

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 20:39	1
Formaldehyde	**30**	**J**	50	20	ug/L		11/20/20 16:15	11/23/20 20:39	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 20:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	107		39 - 153	11/20/20 16:15	11/23/20 20:39	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: B55-PDI-SB-05
Date Collected: 11/18/20 09:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-4
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 17:24	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 17:24	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 17:24	1
1,2,4-Trimethylbenzene	**7.4**		5.0	1.0	ug/L			12/01/20 17:24	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 17:24	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 17:24	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
1,3,5-Trimethylbenzene	**1.6**	**J**	5.0	0.30	ug/L			12/01/20 17:24	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 17:24	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 17:24	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 17:24	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 17:24	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 17:24	1
Acetone	**1.9**	**J**	20	0.70	ug/L			12/01/20 17:24	1
Acetonitrile	ND		100	16	ug/L			12/01/20 17:24	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 17:24	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 17:24	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 17:24	1
Carbon disulfide	**0.25**	**J**	5.0	0.20	ug/L			12/01/20 17:24	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 17:24	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Chloroform	**0.61**	**J**	1.0	0.20	ug/L			12/01/20 17:24	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Cyclohexane	**2.9**	**J**	5.0	1.0	ug/L			12/01/20 17:24	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 17:24	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 17:24	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 17:24	1
Ethylbenzene	**2.5**		1.0	0.40	ug/L			12/01/20 17:24	1
Freon 113	ND		10	0.20	ug/L			12/01/20 17:24	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 17:24	1
Isopropylbenzene	**0.48**	**J**	5.0	0.20	ug/L			12/01/20 17:24	1
m&p-Xylene	**4.5**	**J**	5.0	1.0	ug/L			12/01/20 17:24	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 17:24	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: B55-PDI-SB-05
Date Collected: 11/18/20 09:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-4
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Methylcyclohexane	**1.2**	**J**	5.0	0.50	ug/L			12/01/20 17:24	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 17:24	1
Naphthalene	**1.7**	**J**	5.0	1.0	ug/L			12/01/20 17:24	1
n-Butanol	ND		250	61	ug/L			12/01/20 17:24	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 17:24	1
o-Xylene	**1.7**		1.0	0.40	ug/L			12/01/20 17:24	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 17:24	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 17:24	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 17:24	1
Toluene	**0.23**	**J**	1.0	0.20	ug/L			12/01/20 17:24	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Xylenes, Total	**6.2**		6.0	1.4	ug/L			12/01/20 17:24	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*5.3*	*T J*	*ug/L*		*6.13*			*12/01/20 17:24*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*12/01/20 17:24*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*12/01/20 17:24*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*12/01/20 17:24*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 17:24*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
1,2,4,5-Tetrachlorobenzene	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,2'-oxybis[1-chloropropane]	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,3,4,6-Tetrachlorophenol	ND		13	5.0	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4,5-Trichlorophenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4,6-Trichlorophenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4-Dichlorophenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4-Dimethylphenol	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4-Dinitrophenol	ND		38	18	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4-Dinitrotoluene	ND		6.3	1.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,6-Dinitrotoluene	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2-Chloronaphthalene	ND		1.3	0.50	ug/L		11/25/20 10:15	12/02/20 07:30	1
2-Chlorophenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2-Methylnaphthalene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
2-Methylphenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2-Nitroaniline	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1

Client Sample ID: B55-PDI-SB-05
Date Collected: 11/18/20 09:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-4
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
3,3'-Dichlorobenzidine	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
3-Nitroaniline	ND		8.8	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
4,6-Dinitro-2-methylphenol	ND		26	10	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Bromophenyl-phenylether	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Chloro-3-methylphenol	ND		4.4	2.0	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Chloroaniline	ND		13	5.0	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Chlorophenyl-phenyl ether	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
3,4-Methylphenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Nitroaniline	ND		3.8	1.1	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Nitrophenol	ND		38	13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Acenaphthene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Acenaphthylene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Acetophenone	ND		13	5.0	ug/L		11/25/20 10:15	12/02/20 07:30	1
Aniline	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
Anthracene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Atrazine	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzaldehyde	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzo[a]anthracene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzo[a]pyrene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzo[b]fluoranthene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzo[g,h,i]perylene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzo[k]fluoranthene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzyl alcohol	ND		38	13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Butylbenzylphthalate	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Caprolactam	ND		14	6.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
Carbazole	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Chrysene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Di-n-butyl phthalate	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Di-n-octyl phthalate	ND		14	6.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
Dibenz(a,h)anthracene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Dibenzofuran	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Dicyclohexylamine	ND	*- *1	25	13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Diethyl phthalate	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Dimethyl phthalate	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Fluoranthene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Fluorene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Hexachlorobenzene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Hexachlorobutadiene	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Hexachlorocyclopentadiene	ND		14	6.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
Hexachloroethane	ND		6.3	1.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
Indeno[1,2,3-cd]pyrene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Isophorone	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
n,n'-Dimethylaniline	ND		1.3	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
N-Nitrosodi-n-propylamine	ND		3.8	0.88	ug/L		11/25/20 10:15	12/02/20 07:30	1
N-Nitrosodiphenylamine	ND		3.8	0.88	ug/L		11/25/20 10:15	12/02/20 07:30	1
Naphthalene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Nitrobenzene	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Pentachlorophenol	ND		6.3	1.3	ug/L		11/25/20 10:15	12/02/20 07:30	1

Client Sample ID: B55-PDI-SB-05

Date Collected: 11/18/20 09:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-4

Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenanthrene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Phenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Pyrene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Pyridine	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Triethylamine	ND		13	13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Bis(2-chloroethoxy)methane	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Bis(2-chloroethyl)ether	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Bis(2-ethylhexyl) phthalate	ND		14	6.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
1,4-Dioxane	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*5.6*	*T J*	*ug/L*		*5.45*		*11/25/20 10:15*	*12/02/20 07:30*	*1*
Unknown	*6.7*	*T J*	*ug/L*		*7.98*		*11/25/20 10:15*	*12/02/20 07:30*	*1*
2-Fluoro-6-nitrophenol	*5.4*	*T J N*	*ug/L*		*8.17*	*1526-17-6*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
Unknown	*9.3*	*T J*	*ug/L*		*10.87*		*11/25/20 10:15*	*12/02/20 07:30*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*51*		*10 - 150*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
2-Fluorobiphenyl (Surr)	*59*		*44 - 102*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
2-Fluorophenol (Surr)	*24*		*10 - 84*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
Nitrobenzene-d5 (Surr)	*61*		*23 - 128*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
p-Terphenyl-d14 (Surr)	*32*		*31 - 113*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
Phenol-d5 (Surr)	*22*		*10 - 67*	*11/25/20 10:15*	*12/02/20 07:30*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 20:50	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 20:50	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 20:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*93*		*39 - 153*	*11/20/20 16:15*	*11/23/20 20:50*	*1*

Client Sample ID: B55-PDI-SB-07

Date Collected: 11/18/20 09:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-5

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 17:46	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 17:46	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 17:46	1
1,2,4-Trimethylbenzene	**13**		5.0	1.0	ug/L			12/01/20 17:46	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 17:46	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 17:46	1

Client Sample ID: B55-PDI-SB-07
Date Collected: 11/18/20 09:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-5
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,3,5-Trimethylbenzene	**2.8**	**J**	5.0	0.30	ug/L			12/01/20 17:46	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 17:46	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 17:46	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 17:46	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 17:46	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 17:46	1
Acetone	**1.4**	**J**	20	0.70	ug/L			12/01/20 17:46	1
Acetonitrile	ND		100	16	ug/L			12/01/20 17:46	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 17:46	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 17:46	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 17:46	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 17:46	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 17:46	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Cyclohexane	**4.6**	**J**	5.0	1.0	ug/L			12/01/20 17:46	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 17:46	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 17:46	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 17:46	1
Ethylbenzene	**3.1**		1.0	0.40	ug/L			12/01/20 17:46	1
Freon 113	ND		10	0.20	ug/L			12/01/20 17:46	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 17:46	1
Isopropylbenzene	**0.64**	**J**	5.0	0.20	ug/L			12/01/20 17:46	1
m&p-Xylene	**6.0**		5.0	1.0	ug/L			12/01/20 17:46	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 17:46	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Methylcyclohexane	**2.3**	**J**	5.0	0.50	ug/L			12/01/20 17:46	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 17:46	1
Naphthalene	**1.6**	**J**	5.0	1.0	ug/L			12/01/20 17:46	1
n-Butanol	ND		250	61	ug/L			12/01/20 17:46	1
n-Butylbenzene	**0.20**	**J**	5.0	0.20	ug/L			12/01/20 17:46	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 17:46	1
o-Xylene	**2.0**		1.0	0.40	ug/L			12/01/20 17:46	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 17:46	1

Client Sample ID: B55-PDI-SB-07
Date Collected: 11/18/20 09:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-5
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 17:46	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 17:46	1
Toluene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Xylenes, Total	**8.0**		6.0	1.4	ug/L			12/01/20 17:46	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*7.6*	*T J*	*ug/L*		*6.13*			*12/01/20 17:46*	*1*
Benzene, 1-ethyl-3-methyl-	*5.8*	*T J N*	*ug/L*		*12.53*	*620-14-4*		*12/01/20 17:46*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*12/01/20 17:46*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*12/01/20 17:46*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*12/01/20 17:46*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*12/01/20 17:46*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
1,2,4,5-Tetrachlorobenzene	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,2'-oxybis[1-chloropropane]	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,3,4,6-Tetrachlorophenol	ND		11	4.3	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4,5-Trichlorophenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4,6-Trichlorophenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4-Dichlorophenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4-Dimethylphenol	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4-Dinitrophenol	ND		32	15	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4-Dinitrotoluene	ND		5.4	1.1	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,6-Dinitrotoluene	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Chloronaphthalene	ND		1.1	0.43	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Chlorophenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Methylnaphthalene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Methylphenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Nitroaniline	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Nitrophenol	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
3,3'-Dichlorobenzidine	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
3-Nitroaniline	ND		7.5	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
4,6-Dinitro-2-methylphenol	ND		23	8.6	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Bromophenyl-phenylether	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Chloro-3-methylphenol	ND		3.8	1.7	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Chloroaniline	ND		11	4.3	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Chlorophenyl-phenyl ether	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
3,4-Methylphenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Nitroaniline	ND		3.2	0.97	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Nitrophenol	ND		32	11	ug/L		11/25/20 10:15	12/02/20 17:38	1

Client Sample ID: B55-PDI-SB-07
Date Collected: 11/18/20 09:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-5
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Acenaphthylene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Acetophenone	ND		11	4.3	ug/L		11/25/20 10:15	12/02/20 17:38	1
Aniline	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Anthracene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Atrazine	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzaldehyde	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzo[a]anthracene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzo[a]pyrene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzo[b]fluoranthene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzo[g,h,i]perylene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzo[k]fluoranthene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzyl alcohol	ND		32	11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Butylbenzylphthalate	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Caprolactam	ND		12	5.4	ug/L		11/25/20 10:15	12/02/20 17:38	1
Carbazole	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Chrysene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Di-n-butyl phthalate	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Di-n-octyl phthalate	ND		12	5.4	ug/L		11/25/20 10:15	12/02/20 17:38	1
Dibenz(a,h)anthracene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Dibenzofuran	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Dicyclohexylamine	ND	*- *1	22	11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Diethyl phthalate	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Dimethyl phthalate	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Fluoranthene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Fluorene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Hexachlorobenzene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Hexachlorobutadiene	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Hexachlorocyclopentadiene	ND		12	5.4	ug/L		11/25/20 10:15	12/02/20 17:38	1
Hexachloroethane	ND		5.4	1.1	ug/L		11/25/20 10:15	12/02/20 17:38	1
Indeno[1,2,3-cd]pyrene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Isophorone	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
n,n'-Dimethylaniline	ND		1.1	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
N-Nitrosodi-n-propylamine	ND		3.2	0.75	ug/L		11/25/20 10:15	12/02/20 17:38	1
N-Nitrosodiphenylamine	ND		3.2	0.75	ug/L		11/25/20 10:15	12/02/20 17:38	1
Naphthalene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Nitrobenzene	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Pentachlorophenol	ND		5.4	1.1	ug/L		11/25/20 10:15	12/02/20 17:38	1
Phenanthrene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Phenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Pyrene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Pyridine	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Triethylamine	ND		11	11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Bis(2-chloroethoxy)methane	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Bis(2-chloroethyl)ether	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Bis(2-ethylhexyl) phthalate	ND		12	5.4	ug/L		11/25/20 10:15	12/02/20 17:38	1
1,4-Dioxane	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*14*	*T J*	*ug/L*		*5.45*		*11/25/20 10:15*	*12/02/20 17:38*	*1*

Client Sample ID: B55-PDI-SB-07

Lab Sample ID: 410-21427-5

Date Collected: 11/18/20 09:30

Matrix: Groundwater

Date Received: 11/19/20 11:18

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*10 - 150*	*11/25/20 10:15*	*12/02/20 17:38*	*1*
2-Fluorobiphenyl (Surr)	*74*		*44 - 102*	*11/25/20 10:15*	*12/02/20 17:38*	*1*
2-Fluorophenol (Surr)	*22*		*10 - 84*	*11/25/20 10:15*	*12/02/20 17:38*	*1*
Nitrobenzene-d5 (Surr)	*75*		*23 - 128*	*11/25/20 10:15*	*12/02/20 17:38*	*1*
p-Terphenyl-d14 (Surr)	*41*		*31 - 113*	*11/25/20 10:15*	*12/02/20 17:38*	*1*
Phenol-d5 (Surr)	*22*		*10 - 67*	*11/25/20 10:15*	*12/02/20 17:38*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 21:02	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 21:02	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 21:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*88*		*39 - 153*	*11/20/20 16:15*	*11/23/20 21:02*	*1*

Client Sample ID: B55-PDI-SB-15

Lab Sample ID: 410-21427-6

Date Collected: 11/18/20 10:00

Matrix: Groundwater

Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:08	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 18:08	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 18:08	1
1,2,4-Trimethylbenzene	**10**		5.0	1.0	ug/L			12/01/20 18:08	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 18:08	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:08	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,3,5-Trimethylbenzene	**2.2**	**J**	5.0	0.30	ug/L			12/01/20 18:08	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 18:08	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 18:08	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 18:08	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 18:08	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 18:08	1
Acetone	**8.9**	**J**	20	0.70	ug/L			12/01/20 18:08	1
Acetonitrile	ND		100	16	ug/L			12/01/20 18:08	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 18:08	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 18:08	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 18:08	1
Carbon disulfide	**0.39**	**J**	5.0	0.20	ug/L			12/01/20 18:08	1

Client Sample ID: B55-PDI-SB-15

Date Collected: 11/18/20 10:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-6

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 18:08	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Chloroform	**0.56**	**J**	1.0	0.20	ug/L			12/01/20 18:08	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Cyclohexane	ND		5.0	1.0	ug/L			12/01/20 18:08	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 18:08	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 18:08	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 18:08	1
Ethylbenzene	**2.5**		1.0	0.40	ug/L			12/01/20 18:08	1
Freon 113	ND		10	0.20	ug/L			12/01/20 18:08	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 18:08	1
Isopropylbenzene	**0.55**	**J**	5.0	0.20	ug/L			12/01/20 18:08	1
m&p-Xylene	**4.6**	**J**	5.0	1.0	ug/L			12/01/20 18:08	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 18:08	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Methylcyclohexane	**1.7**	**J**	5.0	0.50	ug/L			12/01/20 18:08	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 18:08	1
Naphthalene	**1.3**	**J**	5.0	1.0	ug/L			12/01/20 18:08	1
n-Butanol	ND		250	61	ug/L			12/01/20 18:08	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 18:08	1
o-Xylene	**1.6**		1.0	0.40	ug/L			12/01/20 18:08	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 18:08	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 18:08	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 18:08	1
Toluene	**0.21**	**J**	1.0	0.20	ug/L			12/01/20 18:08	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Xylenes, Total	**6.2**		6.0	1.4	ug/L			12/01/20 18:08	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 18:08*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/20 18:08*	*1*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*12/01/20 18:08*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*12/01/20 18:08*	*1*

Client Sample ID: B55-PDI-SB-15
Date Collected: 11/18/20 10:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-6
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*12/01/20 18:08*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
1,2,4,5-Tetrachlorobenzene	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,2'-oxybis[1-chloropropane]	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,3,4,6-Tetrachlorophenol	ND		12	4.8	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4,5-Trichlorophenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4,6-Trichlorophenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4-Dichlorophenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4-Dimethylphenol	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4-Dinitrophenol	ND		36	17	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4-Dinitrotoluene	ND		6.0	1.2	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,6-Dinitrotoluene	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Chloronaphthalene	ND		1.2	0.48	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Chlorophenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Methylnaphthalene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Methylphenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Nitroaniline	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Nitrophenol	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
3,3'-Dichlorobenzidine	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
3-Nitroaniline	ND		8.5	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
4,6-Dinitro-2-methylphenol	ND		25	9.7	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Bromophenyl-phenylether	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Chloro-3-methylphenol	ND		4.2	1.9	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Chloroaniline	ND		12	4.8	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Chlorophenyl-phenyl ether	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
3,4-Methylphenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Nitroaniline	ND		3.6	1.1	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Nitrophenol	ND		36	12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Acenaphthene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Acenaphthylene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Acetophenone	ND		12	4.8	ug/L		11/25/20 10:15	12/02/20 18:06	1
Aniline	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
Anthracene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Atrazine	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzaldehyde	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzo[a]anthracene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzo[a]pyrene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzo[b]fluoranthene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzo[g,h,i]perylene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzo[k]fluoranthene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzyl alcohol	ND		36	12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Butylbenzylphthalate	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
Caprolactam	ND		13	6.0	ug/L		11/25/20 10:15	12/02/20 18:06	1
Carbazole	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Chrysene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Di-n-butyl phthalate	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1

Client Sample ID: B55-PDI-SB-15
Date Collected: 11/18/20 10:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-6
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Di-n-octyl phthalate	ND		13	6.0	ug/L		11/25/20 10:15	12/02/20 18:06	1
Dibenz(a,h)anthracene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Dibenzofuran	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Dicyclohexylamine	ND	*- *1	24	12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Diethyl phthalate	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
Dimethyl phthalate	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
Fluoranthene	**0.17**	**J**	0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Fluorene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Hexachlorobenzene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Hexachlorobutadiene	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Hexachlorocyclopentadiene	ND		13	6.0	ug/L		11/25/20 10:15	12/02/20 18:06	1
Hexachloroethane	ND		6.0	1.2	ug/L		11/25/20 10:15	12/02/20 18:06	1
Indeno[1,2,3-cd]pyrene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Isophorone	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
n,n'-Dimethylaniline	ND		1.2	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
N-Nitrosodi-n-propylamine	ND		3.6	0.85	ug/L		11/25/20 10:15	12/02/20 18:06	1
N-Nitrosodiphenylamine	ND		3.6	0.85	ug/L		11/25/20 10:15	12/02/20 18:06	1
Naphthalene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Nitrobenzene	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Pentachlorophenol	ND		6.0	1.2	ug/L		11/25/20 10:15	12/02/20 18:06	1
Phenanthrene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Phenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Pyrene	**0.16**	**J**	0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Pyridine	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
Triethylamine	ND		12	12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Bis(2-chloroethoxy)methane	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Bis(2-chloroethyl)ether	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Bis(2-ethylhexyl) phthalate	ND		13	6.0	ug/L		11/25/20 10:15	12/02/20 18:06	1
1,4-Dioxane	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
1-Hexanol, 2-ethyl-	*6.1*	*T J N*	*ug/L*		*6.79*	*104-76-7*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
Unknown	*6.1*	*T J*	*ug/L*		*10.15*		*11/25/20 10:15*	*12/02/20 18:06*	*1*
Unknown	*14*	*T J*	*ug/L*		*18.69*		*11/25/20 10:15*	*12/02/20 18:06*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*85*		*10 - 150*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
2-Fluorobiphenyl (Surr)	*76*		*44 - 102*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
2-Fluorophenol (Surr)	*47*		*10 - 84*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
Nitrobenzene-d5 (Surr)	*77*		*23 - 128*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
p-Terphenyl-d14 (Surr)	*59*		*31 - 113*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
Phenol-d5 (Surr)	*37*		*10 - 67*	*11/25/20 10:15*	*12/02/20 18:06*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 21:13	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 21:13	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 21:13	1

Client Sample ID: B55-PDI-SB-15

Lab Sample ID: 410-21427-6

Date Collected: 11/18/20 10:00

Matrix: Groundwater

Date Received: 11/19/20 11:18

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	89		39 - 153	11/20/20 16:15	11/23/20 21:13	1

Client Sample ID: B55-PDI-SB-16

Lab Sample ID: 410-21427-7

Date Collected: 11/18/20 10:45

Matrix: Groundwater

Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:30	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 18:30	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 18:30	1
1,2,4-Trimethylbenzene	**6.3**		5.0	1.0	ug/L			12/01/20 18:30	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 18:30	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:30	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,3,5-Trimethylbenzene	**1.4**	**J**	5.0	0.30	ug/L			12/01/20 18:30	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 18:30	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 18:30	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 18:30	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 18:30	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 18:30	1
Acetone	**1.9**	**J**	20	0.70	ug/L			12/01/20 18:30	1
Acetonitrile	ND		100	16	ug/L			12/01/20 18:30	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 18:30	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 18:30	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 18:30	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 18:30	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 18:30	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Cyclohexane	**1.6**	**J**	5.0	1.0	ug/L			12/01/20 18:30	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 18:30	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 18:30	1

Client Sample ID: B55-PDI-SB-16

Date Collected: 11/18/20 10:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-7

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 18:30	1
Ethylbenzene	**1.5**		1.0	0.40	ug/L			12/01/20 18:30	1
Freon 113	ND		10	0.20	ug/L			12/01/20 18:30	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 18:30	1
Isopropylbenzene	**0.29**	**J**	5.0	0.20	ug/L			12/01/20 18:30	1
m&p-Xylene	**2.8**	**J**	5.0	1.0	ug/L			12/01/20 18:30	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 18:30	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Methylcyclohexane	**1.0**	**J**	5.0	0.50	ug/L			12/01/20 18:30	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 18:30	1
Naphthalene	ND		5.0	1.0	ug/L			12/01/20 18:30	1
n-Butanol	ND		250	61	ug/L			12/01/20 18:30	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 18:30	1
o-Xylene	**0.93**	**J**	1.0	0.40	ug/L			12/01/20 18:30	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 18:30	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 18:30	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 18:30	1
Toluene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Xylenes, Total	**3.7**	**J**	6.0	1.4	ug/L			12/01/20 18:30	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 18:30*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/20 18:30*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*12/01/20 18:30*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*12/01/20 18:30*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 18:30*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
1,2,4,5-Tetrachlorobenzene	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,2'-oxybis[1-chloropropane]	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,3,4,6-Tetrachlorophenol	ND		110	42	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,4,5-Trichlorophenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,4,6-Trichlorophenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,4-Dichlorophenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,4-Dimethylphenol	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,4-Dinitrophenol	ND		320	150	ug/L		11/25/20 10:15	12/02/20 18:34	10

Client Sample ID: B55-PDI-SB-16
Date Collected: 11/18/20 10:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-7
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dinitrotoluene	ND		53	11	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,6-Dinitrotoluene	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Chloronaphthalene	ND		11	4.2	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Chlorophenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Methylnaphthalene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Methylphenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Nitroaniline	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Nitrophenol	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
3,3'-Dichlorobenzidine	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
3-Nitroaniline	ND		74	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
4,6-Dinitro-2-methylphenol	ND		220	85	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Bromophenyl-phenylether	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Chloro-3-methylphenol	ND		37	17	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Chloroaniline	ND		110	42	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Chlorophenyl-phenyl ether	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
3,4-Methylphenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Nitroaniline	ND		32	9.6	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Nitrophenol	ND		320	110	ug/L		11/25/20 10:15	12/02/20 18:34	10
Acenaphthene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Acenaphthylene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Acetophenone	ND		110	42	ug/L		11/25/20 10:15	12/02/20 18:34	10
Aniline	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
Anthracene	**1.7**	**J**	5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Atrazine	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzaldehyde	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzo[a]anthracene	**7.6**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzo[a]pyrene	**9.2**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzo[b]fluoranthene	**10**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzo[g,h,i]perylene	**5.0**	**J**	5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzo[k]fluoranthene	**4.6**	**J**	5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzyl alcohol	ND		320	110	ug/L		11/25/20 10:15	12/02/20 18:34	10
Butylbenzylphthalate	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Caprolactam	ND		120	53	ug/L		11/25/20 10:15	12/02/20 18:34	10
Carbazole	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Chrysene	**8.9**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Di-n-butyl phthalate	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Di-n-octyl phthalate	ND		120	53	ug/L		11/25/20 10:15	12/02/20 18:34	10
Dibenz(a,h)anthracene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Dibenzofuran	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Dicyclohexylamine	ND	*- *1	210	110	ug/L		11/25/20 10:15	12/02/20 18:34	10
Diethyl phthalate	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Dimethyl phthalate	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Fluoranthene	**13**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Fluorene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Hexachlorobenzene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Hexachlorobutadiene	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Hexachlorocyclopentadiene	ND		120	53	ug/L		11/25/20 10:15	12/02/20 18:34	10
Hexachloroethane	ND		53	11	ug/L		11/25/20 10:15	12/02/20 18:34	10
Indeno[1,2,3-cd]pyrene	**5.0**	**J**	5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10

Client Sample ID: B55-PDI-SB-16

Date Collected: 11/18/20 10:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-7

Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isophorone	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
n,n'-Dimethylaniline	ND		11	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
N-Nitrosodi-n-propylamine	ND		32	7.4	ug/L		11/25/20 10:15	12/02/20 18:34	10
N-Nitrosodiphenylamine	ND		32	7.4	ug/L		11/25/20 10:15	12/02/20 18:34	10
Naphthalene	**1.4**	**J**	5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Nitrobenzene	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Pentachlorophenol	ND		53	11	ug/L		11/25/20 10:15	12/02/20 18:34	10
Phenanthrene	**7.1**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Phenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Pyrene	**15**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Pyridine	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Triethylamine	ND		110	110	ug/L		11/25/20 10:15	12/02/20 18:34	10
Bis(2-chloroethoxy)methane	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Bis(2-chloroethyl)ether	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Bis(2-ethylhexyl) phthalate	**56**	**J**	120	53	ug/L		11/25/20 10:15	12/02/20 18:34	10
1,4-Dioxane	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*11/25/20 10:15*	*12/02/20 18:34*	*10*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*67*		*10 - 150*	*11/25/20 10:15*	*12/02/20 18:34*	*10*
2-Fluorobiphenyl (Surr)	*93*		*44 - 102*	*11/25/20 10:15*	*12/02/20 18:34*	*10*
2-Fluorophenol (Surr)	*45*		*10 - 84*	*11/25/20 10:15*	*12/02/20 18:34*	*10*
Nitrobenzene-d5 (Surr)	*88*		*23 - 128*	*11/25/20 10:15*	*12/02/20 18:34*	*10*
p-Terphenyl-d14 (Surr)	*63*		*31 - 113*	*11/25/20 10:15*	*12/02/20 18:34*	*10*
Phenol-d5 (Surr)	*37*		*10 - 67*	*11/25/20 10:15*	*12/02/20 18:34*	*10*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 21:24	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 21:24	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 21:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*94*		*39 - 153*	*11/20/20 16:15*	*11/23/20 21:24*	*1*

Client Sample ID: B55-PDI-SB-18

Date Collected: 11/18/20 12:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-8

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:52	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 18:52	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 18:52	1
1,2,4-Trimethylbenzene	**7.1**		5.0	1.0	ug/L			12/01/20 18:52	1

Client Sample ID: B55-PDI-SB-18
Date Collected: 11/18/20 12:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-8
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 18:52	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:52	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:52	1
1,2-Dichloropropane	**0.47**	**J**	1.0	0.20	ug/L			12/01/20 18:52	1
1,3,5-Trimethylbenzene	**4.4**	**J**	5.0	0.30	ug/L			12/01/20 18:52	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:52	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:52	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 18:52	1
2-Butanone	**11**		10	0.30	ug/L			12/01/20 18:52	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 18:52	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 18:52	1
4-Methyl-2-pentanone	**0.52**	**J**	10	0.50	ug/L			12/01/20 18:52	1
Acetone	**18**	**J**	20	0.70	ug/L			12/01/20 18:52	1
Acetonitrile	ND		100	16	ug/L			12/01/20 18:52	1
Benzene	**0.51**	**J**	1.0	0.20	ug/L			12/01/20 18:52	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 18:52	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 18:52	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 18:52	1
Carbon disulfide	**0.34**	**J**	5.0	0.20	ug/L			12/01/20 18:52	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 18:52	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Cyclohexane	**13**		5.0	1.0	ug/L			12/01/20 18:52	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 18:52	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 18:52	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 18:52	1
Ethylbenzene	**5.4**		1.0	0.40	ug/L			12/01/20 18:52	1
Freon 113	ND		10	0.20	ug/L			12/01/20 18:52	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 18:52	1
Isopropylbenzene	**2.2**	**J**	5.0	0.20	ug/L			12/01/20 18:52	1
m&p-Xylene	**7.8**		5.0	1.0	ug/L			12/01/20 18:52	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 18:52	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Methylcyclohexane	**26**		5.0	0.50	ug/L			12/01/20 18:52	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 18:52	1
Naphthalene	**2.6**	**J**	5.0	1.0	ug/L			12/01/20 18:52	1
n-Butanol	ND		250	61	ug/L			12/01/20 18:52	1
n-Butylbenzene	**2.0**	**J**	5.0	0.20	ug/L			12/01/20 18:52	1
n-Heptane	**9.6**		5.0	2.0	ug/L			12/01/20 18:52	1
o-Xylene	**3.4**		1.0	0.40	ug/L			12/01/20 18:52	1

Client Sample ID: B55-PDI-SB-18

Date Collected: 11/18/20 12:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-8

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
p-Isopropyltoluene	**0.58**	**J**	5.0	0.20	ug/L			12/01/20 18:52	1
sec-Butylbenzene	**1.1**	**J**	5.0	0.20	ug/L			12/01/20 18:52	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 18:52	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 18:52	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 18:52	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 18:52	1
Toluene	**0.51**	**J**	1.0	0.20	ug/L			12/01/20 18:52	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Xylenes, Total	**11**		6.0	1.4	ug/L			12/01/20 18:52	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Pentane, 3-methyl-	*29*	*T J N*	*ug/L*		*4.81*	*96-14-0*		*12/01/20 18:52*	*1*
Hexane, 2-methyl-	*12*	*T J N*	*ug/L*		*7.02*	*591-76-4*		*12/01/20 18:52*	*1*
Hexane, 3-methyl-	*13*	*T J N*	*ug/L*		*7.27*	*589-34-4*		*12/01/20 18:52*	*1*
Cyclopentane, 1,3-dimethyl-, cis-	*9.7*	*T J N*	*ug/L*		*7.59*	*2532-58-3*		*12/01/20 18:52*	*1*
Benzene, 1-ethyl-2-methyl-	*11*	*T J N*	*ug/L*		*12.75*	*611-14-3*		*12/01/20 18:52*	*1*
Benzene, 1-ethyl-2,4-dimethyl-	*19*	*T J N*	*ug/L*		*13.65*	*874-41-9*		*12/01/20 18:52*	*1*
Indan, 1-methyl-	*14*	*T J N*	*ug/L*		*13.75*	*767-58-8*		*12/01/20 18:52*	*1*
Benzene, 1,2,3,4-tetramethyl-	*12*	*T J N*	*ug/L*		*13.93*	*488-23-3*		*12/01/20 18:52*	*1*
1H-Indene, 2,3-dihydro-5-methyl-	*14*	*T J N*	*ug/L*		*14.17*	*874-35-1*		*12/01/20 18:52*	*1*
Benzene, 2-ethenyl-1,4-dimethyl-	*23*	*T J N*	*ug/L*		*14.27*	*2039-89-6*		*12/01/20 18:52*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*12/01/20 18:52*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*12/01/20 18:52*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*12/01/20 18:52*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 18:52*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
1,2,4,5-Tetrachlorobenzene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,2'-oxybis[1-chloropropane]	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,3,4,6-Tetrachlorophenol	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4,5-Trichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4,6-Trichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4-Dichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4-Dimethylphenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4-Dinitrophenol	ND		31	14	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4-Dinitrotoluene	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,6-Dinitrotoluene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2-Chloronaphthalene	ND		1.0	0.41	ug/L		11/25/20 10:15	12/02/20 19:02	1
2-Chlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2-Methylnaphthalene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
2-Methylphenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1

Client Sample ID: B55-PDI-SB-18
Date Collected: 11/18/20 12:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-8
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitroaniline	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
2-Nitrophenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
3,3'-Dichlorobenzidine	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
3-Nitroaniline	ND		7.2	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
4,6-Dinitro-2-methylphenol	ND		22	8.2	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Bromophenyl-phenylether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Chloro-3-methylphenol	ND		3.6	1.6	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Chloroaniline	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Chlorophenyl-phenyl ether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
3,4-Methylphenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Nitroaniline	ND		3.1	0.93	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Nitrophenol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Acenaphthene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Acenaphthylene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Acetophenone	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Aniline	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Anthracene	**0.23**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Atrazine	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzaldehyde	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzo[a]anthracene	**0.20**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzo[a]pyrene	**0.21**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzo[b]fluoranthene	**0.20**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzo[g,h,i]perylene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzo[k]fluoranthene	**0.13**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzyl alcohol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Butylbenzylphthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Caprolactam	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 19:02	1
Carbazole	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Chrysene	**0.27**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Di-n-butyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Di-n-octyl phthalate	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 19:02	1
Dibenz(a,h)anthracene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Dibenzofuran	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Dicyclohexylamine	ND	*- *1	21	10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Diethyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Dimethyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Fluoranthene	**0.53**		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Fluorene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Hexachlorobenzene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Hexachlorobutadiene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Hexachlorocyclopentadiene	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 19:02	1
Hexachloroethane	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 19:02	1
Indeno[1,2,3-cd]pyrene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Isophorone	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
n,n'-Dimethylaniline	ND		1.0	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
N-Nitrosodi-n-propylamine	ND		3.1	0.72	ug/L		11/25/20 10:15	12/02/20 19:02	1
N-Nitrosodiphenylamine	ND		3.1	0.72	ug/L		11/25/20 10:15	12/02/20 19:02	1
Naphthalene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Nitrobenzene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1

Client Sample ID: B55-PDI-SB-18

Lab Sample ID: 410-21427-8

Date Collected: 11/18/20 12:00

Matrix: Groundwater

Date Received: 11/19/20 11:18

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 19:02	1
Phenanthrene	**0.24**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Phenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Pyrene	**0.46**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Pyridine	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Triethylamine	ND		10	10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Bis(2-chloroethoxy)methane	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Bis(2-chloroethyl)ether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Bis(2-ethylhexyl) phthalate	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 19:02	1
1,4-Dioxane	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Octadecane	*4.9*	*T J N*	*ug/L*		*16.66*	*593-45-3*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
Docosane	*10*	*T J N*	*ug/L*		*17.85*	*629-97-0*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
Octacosane	*9.8*	*T J N*	*ug/L*		*18.44*	*630-02-4*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
Hexatriacontane	*4.9*	*T J N*	*ug/L*		*20.12*	*630-06-8*	*11/25/20 10:15*	*12/02/20 19:02*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*77*		*10 - 150*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
2-Fluorobiphenyl (Surr)	*76*		*44 - 102*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
2-Fluorophenol (Surr)	*48*		*10 - 84*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
Nitrobenzene-d5 (Surr)	*77*		*23 - 128*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
p-Terphenyl-d14 (Surr)	*60*		*31 - 113*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
Phenol-d5 (Surr)	*37*		*10 - 67*	*11/25/20 10:15*	*12/02/20 19:02*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 21:36	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 21:36	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 21:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*94*		*39 - 153*	*11/20/20 16:15*	*11/23/20 21:36*	*1*

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Lab Sample ID: 410-21427-9

Date Collected: 11/18/20 12:10

Date Collected is 11/17/20
Date Recorded Here is the Sample Shipment Date

Matrix: Soil

Date Received: 11/19/20 11:18

Percent Solids: 81.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,1,2,2-Tetrachloroethane	ND		0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,1,2-Trichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,1-Dichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,1-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2,3-Trichlorobenzene	ND		0.0092	0.0046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2,4-Trichlorobenzene	ND		0.0092	0.0046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2,4-Trimethylbenzene	ND	F1	0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2-Dibromo-3-Chloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2-Dibromoethane	ND		0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2-Dichlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Date Collected: 11/18/20 12:10
Date Received: 11/19/20 11:18

Date Collected is 11/17/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9
Matrix: Soil
Percent Solids: 81.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2-Dichloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,3,5-Trimethylbenzene	ND	F1	0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,3-Dichlorobenzene	ND	F1	0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,4-Dichlorobenzene	ND	F1	0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,4-Dioxane	ND		0.23	0.034	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
2-Butanone	**0.0020**	**J**	0.0092	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
2-Hexanone	ND		0.0092	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
2-Nitropropane	ND		0.0092	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
4-Methyl-2-pentanone	ND		0.0092	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Acetone	**0.028**	**F1**	0.018	0.0055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Acetonitrile	ND		0.092	0.023	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Benzene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Bromochloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Bromodichloromethane	ND		0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Bromoform	ND		0.0092	0.0046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Bromomethane	ND		0.0046	0.00064	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Carbon disulfide	**0.00070**	**J**	0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Carbon tetrachloride	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Chlorobenzene	ND	F1	0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Chlorodifluoromethane	ND	F1	0.0092	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Chloroethane	ND		0.0046	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Chloroform	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Chloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
cis-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
cis-1,3-Dichloropropene	ND		0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Cyclohexane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Cyclohexanone	ND		0.23	0.023	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Dibromochloromethane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Dichlorodifluoromethane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Ethyl acetate	ND		0.0046	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Ethyl ether	ND		0.0046	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Ethylbenzene	ND	F1	0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Freon 113	ND		0.0092	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Isobutyl alcohol	ND		0.23	0.035	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Isopropylbenzene	ND	F1	0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
m&p-Xylene	ND	F1	0.0046	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Methyl acetate	ND		0.0046	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Methyl tertiary butyl ether	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Methylcyclohexane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Methylene Chloride	ND		0.0046	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Naphthalene	ND		0.0046	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
n-Butanol	ND		0.23	0.051	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
n-Butylbenzene	ND	F1	0.0073	0.0027	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
n-Heptane	ND		0.0073	0.0027	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
o-Xylene	ND	F1	0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
p-Isopropyltoluene	ND	F1	0.0046	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
sec-Butylbenzene	ND	F1	0.0046	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Styrene	ND	F1	0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Date Collected: 11/18/20 12:10 Date Collected is 11/17/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9

Matrix: Soil
Percent Solids: 81.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
t-Butyl alcohol	ND		0.092	0.014	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
tert-Butylbenzene	ND	F1	0.0046	0.00073	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Tetrachloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Tetrahydrofuran	ND		0.0073	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Toluene	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
trans-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
trans-1,3-Dichloropropene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Trichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Trichlorofluoromethane	ND		0.0046	0.00064	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Vinyl chloride	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Xylenes, Total	ND	F1	0.0092	0.0013	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.010*	*T J*	*mg/Kg*	☼	*11.17*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
Unknown	*0.0087*	*T J*	*mg/Kg*	☼	*11.23*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
Dodecane, 4-methyl-	*0.012*	*T J N*	*mg/Kg*	☼	*11.50*	*6117-97-1*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
Unknown	*0.0094*	*T J*	*mg/Kg*	☼	*11.56*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
1-Tetradecene	*0.0093*	*T J N*	*mg/Kg*	☼	*11.58*	*1120-36-1*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
Unknown	*0.0084*	*T J*	*mg/Kg*	☼	*11.63*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
Trifluoroacetic acid, n-heptadecyl ester	*0.015*	*T J N*	*mg/Kg*	☼	*11.74*	*1000216-79-2*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
Unknown	*0.0097*	*T J*	*mg/Kg*	☼	*11.87*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
Unknown	*0.013*	*T J*	*mg/Kg*	☼	*12.05*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
1-Decanol, 2-hexyl-	*0.011*	*T J N*	*mg/Kg*	☼	*12.10*	*2425-77-6*	*11/19/20 22:08*	*11/24/20 18:10*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
4-Bromofluorobenzene (Surr)	*95*		*50 - 131*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
Toluene-d8 (Surr)	*102*		*52 - 141*	*11/19/20 22:08*	*11/24/20 18:10*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
1,2,4,5-Tetrachlorobenzene	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,2'-oxybis[1-chloropropane]	ND		0.053	0.024	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4,5-Trichlorophenol	ND		0.081	0.037	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4,6-Trichlorophenol	ND		0.069	0.033	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4-Dichlorophenol	ND		0.053	0.024	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4-Dimethylphenol	ND	F1	0.081	0.037	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4-Dinitrophenol	ND	F1 F2	1.2	0.41	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4-Dinitrotoluene	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,6-Dinitrotoluene	ND		0.061	0.028	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Chloronaphthalene	ND		0.041	0.0081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Chlorophenol	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Methylnaphthalene	**0.0042**	**J**	0.041	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Methylphenol	ND		0.081	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Nitroaniline	ND		0.061	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Nitrophenol	ND	F1 F2	0.069	0.033	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Date Collected: 11/18/20 12:10
Date Received: 11/19/20 11:18

Date Collected is 11/17/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9
Matrix: Soil
Percent Solids: 81.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3,3'-Dichlorobenzidine	ND	F1 F2	0.41	0.12	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
3-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4,6-Dinitro-2-methylphenol	ND	F1 F2	0.61	0.28	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Bromophenyl-phenylether	ND		0.061	0.028	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Chloro-3-methylphenol	ND		0.061	0.028	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
3,4-Methylphenol	ND		0.061	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Nitrophenol	ND		0.61	0.20	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Acenaphthene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Acenaphthylene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Acetophenone	ND		0.061	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Anthracene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Atrazine	ND		0.53	0.24	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzaldehyde	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzo[a]anthracene	ND		0.020	0.0081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzo[a]pyrene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzo[b]fluoranthene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzo[g,h,i]perylene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzo[k]fluoranthene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Bis(2-chloroethoxy)methane	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Bis(2-chloroethyl)ether	ND		0.061	0.028	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Butylbenzylphthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Caprolactam	ND	F1	0.20	0.041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Carbazole	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Chrysene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Di-n-butyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Di-n-octyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Dibenz(a,h)anthracene	ND		0.020	0.0081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Dibenzofuran	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Diethyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Dimethyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Fluoranthene	**0.0089**	**J**	0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Chloroaniline	ND		0.20	0.041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Fluorene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Chlorophenyl-phenyl ether	ND		0.053	0.024	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Hexachlorobenzene	ND		0.020	0.0081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Hexachlorobutadiene	ND		0.094	0.045	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Hexachlorocyclopentadiene	ND	F1	0.61	0.24	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Hexachloroethane	ND	F1 F2	0.20	0.041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Isophorone	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
N-Nitrosodi-n-propylamine	ND		0.061	0.028	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
N-Nitrosodiphenylamine	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Naphthalene	ND		0.020	0.0081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Nitrobenzene	ND		0.081	0.033	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Phenanthrene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Aniline	ND		0.61	0.20	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Phenol	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Date Collected: 11/18/20 12:10 Date Collected is 11/17/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9

Matrix: Soil
Percent Solids: 81.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pyrene	**0.011**	**J**	0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Pentachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzyl alcohol	ND		0.61	0.20	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
n,n'-Dimethylaniline	ND		0.20	0.041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Pyridine	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Triethylamine	ND	*- *1	6.1	2.0	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
1,4-Dioxane	ND		0.41	0.12	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Furan, 2,5-dimethyl-	*0.17*	*T B J N*	*mg/Kg*	☼	*2.27*	*625-86-5*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*1.5*	*T B J*	*mg/Kg*	☼	*3.89*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
2-Cyclohexen-1-one	*0.58*	*T J N*	*mg/Kg*	☼	*4.81*	*930-68-7*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Cyclohexane, isothiocyanato-	*0.31*	*T J N*	*mg/Kg*	☼	*7.05*	*1122-82-3*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*0.37*	*T J*	*mg/Kg*	☼	*8.28*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.36*	*T J N*	*mg/Kg*	☼	*8.59*	*7560-83-0*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*0.31*	*T J*	*mg/Kg*	☼	*8.79*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*0.27*	*T J*	*mg/Kg*	☼	*8.85*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*1.1*	*T J*	*mg/Kg*	☼	*8.90*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*0.42*	*T J*	*mg/Kg*	☼	*9.39*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*0.28*	*T J*	*mg/Kg*	☼	*10.07*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Cyclic octaatomic sulfur	*0.78*	*T J N*	*mg/Kg*	☼	*11.15*	*10544-50-0*	*11/21/20 07:13*	*11/25/20 20:49*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*102*		*45 - 108*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Nitrobenzene-d5 (Surr)	*72*		*32 - 97*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
2-Fluorophenol (Surr)	*86*		*26 - 96*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
2-Fluorobiphenyl (Surr)	*79*		*39 - 100*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
2,4,6-Tribromophenol (Surr)	*83*		*13 - 121*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Phenol-d5 (Surr)	*93*		*27 - 104*	*11/21/20 07:13*	*11/25/20 20:49*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**24**		12	4.1	mg/Kg	☼	11/21/20 07:13	12/03/20 11:59	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*89*		*45 - 108*	*11/21/20 07:13*	*12/03/20 11:59*	*5*
Nitrobenzene-d5 (Surr)	*65*		*32 - 97*	*11/21/20 07:13*	*12/03/20 11:59*	*5*
2-Fluorophenol (Surr)	*75*		*26 - 96*	*11/21/20 07:13*	*12/03/20 11:59*	*5*
2-Fluorobiphenyl (Surr)	*75*		*39 - 100*	*11/21/20 07:13*	*12/03/20 11:59*	*5*
2,4,6-Tribromophenol (Surr)	*70*		*13 - 121*	*11/21/20 07:13*	*12/03/20 11:59*	*5*
Phenol-d5 (Surr)	*78*		*27 - 104*	*11/21/20 07:13*	*12/03/20 11:59*	*5*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.061	0.031	mg/Kg	☼	11/22/20 09:12	11/24/20 01:25	1
Formaldehyde	**0.11**		0.092	0.031	mg/Kg	☼	11/22/20 09:12	11/24/20 01:25	1
Glutaraldehyde	ND		0.061	0.031	mg/Kg	☼	11/22/20 09:12	11/24/20 01:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*101*		*77 - 133*	*11/22/20 09:12*	*11/24/20 01:25*	*1*

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Date Collected: 11/18/20 12:10
Date Received: 11/19/20 11:18

Date Collected is 11/17/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9
Matrix: Soil
Percent Solids: 81.8

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	18.2		1.0	1.0	%			11/20/20 00:15	1

Client Sample ID: B55-PDI-SB-10 (9-10)

Date Collected: 11/18/20 12:30
Date Received: 11/19/20 11:18

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-10
Matrix: Soil
Percent Solids: 78.5

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
trans-1,3-Dichloropropene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Ethylbenzene	0.68		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Styrene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,4-Dichlorobenzene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2-Dibromoethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2-Dichloroethane	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
4-Methyl-2-pentanone	ND		0.61	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Toluene	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Chlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Cyclohexane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2,4-Trichlorobenzene	ND		0.61	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,4-Dioxane	ND		15	2.3	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Dibromochloromethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Tetrachloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
cis-1,2-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
trans-1,2-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Methyl tertiary butyl ether	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
m&p-Xylene	1.0		0.30	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,3,5-Trimethylbenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,3-Dichlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Carbon tetrachloride	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
2-Hexanone	ND		0.61	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Acetone	ND		1.2	0.37	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Chloroform	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Benzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,1,1-Trichloroethane	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Bromomethane	ND		0.30	0.043	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Chloromethane	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Bromochloromethane	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Chloroethane	ND		0.30	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Vinyl chloride	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Methylene Chloride	ND		0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Carbon disulfide	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Bromoform	ND	*	0.61	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Bromodichloromethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,1-Dichloroethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,1-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Trichlorofluoromethane	ND		0.30	0.043	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Dichlorodifluoromethane	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Freon 113	ND		0.61	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2-Dichloropropane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: B55-PDI-SB-10 (9-10)
Date Collected: 11/18/20 12:30
Date Received: 11/19/20 11:18

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-10
Matrix: Soil
Percent Solids: 78.5

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone	ND		0.61	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,1,2-Trichloroethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
2-Nitropropane	ND	*	0.61	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Trichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Methyl acetate	ND		0.30	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,1,2,2-Tetrachloroethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2,3-Trichlorobenzene	ND		0.61	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
o-Xylene	**0.14**	**J**	0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2-Dichlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2-Dibromo-3-Chloropropane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Acetonitrile	ND		6.1	1.5	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Isopropylbenzene	**2.3**		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Chlorodifluoromethane	ND		0.61	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Cyclohexanone	ND		15	1.5	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Ethyl acetate	ND		0.30	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Ethyl ether	ND		0.30	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Isobutyl alcohol	ND		15	2.3	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Naphthalene	**0.26**	**J**	0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
n-Butanol	ND		15	3.4	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
n-Butylbenzene	**10**		0.49	0.18	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
n-Heptane	**6.1**		0.49	0.18	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
p-Isopropyltoluene	**2.1**		0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
sec-Butylbenzene	**3.6**		0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
t-Butyl alcohol	ND		6.1	0.91	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
tert-Butylbenzene	**0.090**	**J**	0.30	0.049	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Tetrahydrofuran	ND		0.49	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Xylenes, Total	**1.1**		0.61	0.085	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Pentane, 3-methyl-	*24*	*T J N*	*mg/Kg*	☼	*4.86*	*96-14-0*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Pentane, 2,3-dimethyl-	*17*	*T J N*	*mg/Kg*	☼	*7.20*	*565-59-3*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Hexane, 3-methyl-	*28*	*T J N*	*mg/Kg*	☼	*7.32*	*589-34-4*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Heptane, 3-methyl-	*31*	*T J N*	*mg/Kg*	☼	*9.64*	*589-81-1*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Unknown	*16*	*T J*	*mg/Kg*	☼	*10.13*		*11/19/20 23:03*	*11/25/20 02:26*	*50*
Unknown	*16*	*T J*	*mg/Kg*	☼	*10.39*		*11/19/20 23:03*	*11/25/20 02:26*	*50*
Unknown	*27*	*T J*	*mg/Kg*	☼	*11.12*		*11/19/20 23:03*	*11/25/20 02:26*	*50*
Unknown	*20*	*T J*	*mg/Kg*	☼	*11.23*		*11/19/20 23:03*	*11/25/20 02:26*	*50*
Benzene, 4-ethyl-1,2-dimethyl-	*21*	*T J N*	*mg/Kg*	☼	*13.68*	*934-80-5*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Benzene, 2-ethenyl-1,4-dimethyl-	*18*	*T J N*	*mg/Kg*	☼	*14.30*	*2039-89-6*	*11/19/20 23:03*	*11/25/20 02:26*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
4-Bromofluorobenzene (Surr)	*153*	*X*	*50 - 131*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Dibromofluoromethane (Surr)	*96*		*50 - 141*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Toluene-d8 (Surr)	*120*		*52 - 141*	*11/19/20 23:03*	*11/25/20 02:26*	*50*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	**58**		3.0	0.37	mg/Kg	☼	11/19/20 23:03	11/25/20 02:47	500
1,2,4-Trimethylbenzene	**47**		3.0	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 02:47	500

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: B55-PDI-SB-10 (9-10)
Date Collected: 11/18/20 12:30
Date Received: 11/19/20 11:18

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-10
Matrix: Soil
Percent Solids: 78.5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		54 - 135	11/19/20 23:03	11/25/20 02:47	500
4-Bromofluorobenzene (Surr)	150	X	50 - 131	11/19/20 23:03	11/25/20 02:47	500
Dibromofluoromethane (Surr)	93		50 - 141	11/19/20 23:03	11/25/20 02:47	500
Toluene-d8 (Surr)	116		52 - 141	11/19/20 23:03	11/25/20 02:47	500

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	**0.053**		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
1,2,4,5-Tetrachlorobenzene	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,2'-oxybis[1-chloropropane]	ND		0.055	0.025	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4,5-Trichlorophenol	ND		0.085	0.038	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4,6-Trichlorophenol	ND		0.072	0.034	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4-Dichlorophenol	ND		0.055	0.025	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4-Dimethylphenol	ND		0.085	0.038	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4-Dinitrophenol	ND		1.3	0.42	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4-Dinitrotoluene	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,6-Dinitrotoluene	ND		0.064	0.030	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Chloronaphthalene	ND		0.042	0.0085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Chlorophenol	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Methylnaphthalene	ND		0.042	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Methylphenol	ND		0.085	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Nitroaniline	ND		0.064	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Nitrophenol	ND		0.072	0.034	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
3,3'-Dichlorobenzidine	ND		0.42	0.13	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
3-Nitroaniline	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4,6-Dinitro-2-methylphenol	ND		0.64	0.30	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Bromophenyl-phenylether	ND		0.064	0.030	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Chloro-3-methylphenol	ND		0.064	0.030	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
3,4-Methylphenol	ND		0.064	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Nitroaniline	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Nitrophenol	ND		0.64	0.21	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Acenaphthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Acenaphthylene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Acetophenone	ND		0.064	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Anthracene	**0.018**	**J**	0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Atrazine	ND		0.55	0.25	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzaldehyde	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzo[a]anthracene	ND		0.021	0.0085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzo[a]pyrene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzo[b]fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzo[g,h,i]perylene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzo[k]fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Bis(2-chloroethoxy)methane	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Bis(2-chloroethyl)ether	ND		0.064	0.030	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Bis(2-ethylhexyl) phthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Butylbenzylphthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Caprolactam	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Carbazole	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Chrysene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: B55-PDI-SB-10 (9-10)
Date Collected: 11/18/20 12:30
Date Received: 11/19/20 11:18

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-10
Matrix: Soil
Percent Solids: 78.5

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Di-n-butyl phthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Di-n-octyl phthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Dibenz(a,h)anthracene	ND		0.021	0.0085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Dibenzofuran	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Diethyl phthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Dimethyl phthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Chloroaniline	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Fluorene	**0.036**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Chlorophenyl-phenyl ether	ND		0.055	0.025	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Hexachlorobenzene	ND		0.021	0.0085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Hexachlorobutadiene	ND		0.098	0.047	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Hexachlorocyclopentadiene	ND		0.64	0.25	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Hexachloroethane	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Isophorone	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
N-Nitrosodi-n-propylamine	ND		0.064	0.030	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
N-Nitrosodiphenylamine	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Naphthalene	ND		0.021	0.0085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Nitrobenzene	ND		0.085	0.034	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Phenanthrene	**0.084**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Aniline	ND		0.64	0.21	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Phenol	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Pyrene	**0.025**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Pentachlorophenol	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzyl alcohol	ND		0.64	0.21	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
n,n'-Dimethylaniline	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Pyridine	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Triethylamine	ND	*- *1	6.4	2.1	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
1,4-Dioxane	ND		0.42	0.13	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Benzene, 1,2-diethyl-	*11*	*T J N*	*mg/Kg*	☼	*5.78*	*135-01-3*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Unknown	*19*	*T J*	*mg/Kg*	☼	*5.85*		*11/21/20 07:13*	*11/25/20 20:01*	*1*
Benzene, 1-methyl-2-propyl-	*13*	*T J N*	*mg/Kg*	☼	*5.92*	*1074-17-5*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Benzene, 4-ethyl-1,2-dimethyl-	*10*	*T J N*	*mg/Kg*	☼	*5.99*	*934-80-5*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Unknown	*11*	*T J*	*mg/Kg*	☼	*6.23*		*11/21/20 07:13*	*11/25/20 20:01*	*1*
Benzene, 1,2,4,5-tetramethyl-	*13*	*T J N*	*mg/Kg*	☼	*6.28*	*95-93-2*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Unknown	*19*	*T J*	*mg/Kg*	☼	*6.31*		*11/21/20 07:13*	*11/25/20 20:01*	*1*
Benzene, 1,3-diethyl-5-methyl-	*9.7*	*T J N*	*mg/Kg*	☼	*6.43*	*2050-24-0*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
1-Phenyl-1-butene	*11*	*T J N*	*mg/Kg*	☼	*6.45*	*824-90-8*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Unknown	*34*	*T J*	*mg/Kg*	☼	*6.52*		*11/21/20 07:13*	*11/25/20 20:01*	*1*
Unknown	*20*	*T J*	*mg/Kg*	☼	*6.57*		*11/21/20 07:13*	*11/25/20 20:01*	*1*
Benzene, diethylmethyl-	*20*	*T J N*	*mg/Kg*	☼	*6.61*	*25550-13-4*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Benzene, 1-methyl-4-(1-methylpropyl)-	*12*	*T J N*	*mg/Kg*	☼	*6.66*	*1595-16-0*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Benzene, (1-methyl-1-butenyl)-	*11*	*T J N*	*mg/Kg*	☼	*6.74*	*53172-84-2*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Unknown	*36*	*T J*	*mg/Kg*	☼	*6.80*		*11/21/20 07:13*	*11/25/20 20:01*	*1*
Benzene, ethyl-1,2,4-trimethyl-	*14*	*T J N*	*mg/Kg*	☼	*6.87*	*54120-62-6*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Unknown	*13*	*T J*	*mg/Kg*	☼	*6.96*		*11/21/20 07:13*	*11/25/20 20:01*	*1*

Client Sample ID: B55-PDI-SB-10 (9-10)

Lab Sample ID: 410-21427-10

Date Collected: 11/18/20 12:30 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 78.5

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	15	T J	mg/Kg	☼	7.04		11/21/20 07:13	11/25/20 20:01	1
Unknown	9.6	T J	mg/Kg	☼	7.08		11/21/20 07:13	11/25/20 20:01	1
Unknown	11	T J	mg/Kg	☼	7.11		11/21/20 07:13	11/25/20 20:01	1
1H-Indene, 2,3-dihydro-5,6-dimethyl-	18	T J N	mg/Kg	☼	7.15	1075-22-5	11/21/20 07:13	11/25/20 20:01	1
Dodecane, 4,6-dimethyl-	17	T J N	mg/Kg	☼	7.23	61141-72-8	11/21/20 07:13	11/25/20 20:01	1
Unknown	13	T J	mg/Kg	☼	7.28		11/21/20 07:13	11/25/20 20:01	1
1H-Indene, 2,3-dihydro-1,1,3-trimethyl-	12	T J N	mg/Kg	☼	7.39	2613-76-5	11/21/20 07:13	11/25/20 20:01	1
Unknown	17	T J	mg/Kg	☼	8.91		11/21/20 07:13	11/25/20 20:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	86		45 - 108	11/21/20 07:13	11/25/20 20:01	1
Nitrobenzene-d5 (Surr)	68		32 - 97	11/21/20 07:13	11/25/20 20:01	1
2-Fluorophenol (Surr)	66		26 - 96	11/21/20 07:13	11/25/20 20:01	1
2-Fluorobiphenyl (Surr)	74		39 - 100	11/21/20 07:13	11/25/20 20:01	1
2,4,6-Tribromophenol (Surr)	76		13 - 121	11/21/20 07:13	11/25/20 20:01	1
Phenol-d5 (Surr)	70		27 - 104	11/21/20 07:13	11/25/20 20:01	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**21**		13	4.2	mg/Kg	☼	11/21/20 07:13	12/02/20 15:20	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	78		45 - 108	11/21/20 07:13	12/02/20 15:20	5
Nitrobenzene-d5 (Surr)	66		32 - 97	11/21/20 07:13	12/02/20 15:20	5
2-Fluorophenol (Surr)	57		26 - 96	11/21/20 07:13	12/02/20 15:20	5
2-Fluorobiphenyl (Surr)	69		39 - 100	11/21/20 07:13	12/02/20 15:20	5
2,4,6-Tribromophenol (Surr)	58		13 - 121	11/21/20 07:13	12/02/20 15:20	5
Phenol-d5 (Surr)	62		27 - 104	11/21/20 07:13	12/02/20 15:20	5

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.064	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:36	1
Formaldehyde	**0.27**		0.096	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:36	1
Glutaraldehyde	ND		0.064	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	103		77 - 133	11/22/20 09:12	11/24/20 01:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**21.5**		1.0	1.0	%			11/20/20 00:15	1

Client Sample ID: DUP111820

Lab Sample ID: 410-21427-11

Date Collected: 11/18/20 00:00 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 79.1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
trans-1,3-Dichloropropene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: DUP111820
Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-11
Matrix: Soil
Percent Solids: 79.1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	**0.95**		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Styrene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,4-Dichlorobenzene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2-Dibromoethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2-Dichloroethane	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
4-Methyl-2-pentanone	ND		0.59	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Toluene	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Chlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Cyclohexane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2,4-Trichlorobenzene	ND		0.59	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,4-Dioxane	ND		15	2.2	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Dibromochloromethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Tetrachloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
cis-1,2-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
trans-1,2-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Methyl tertiary butyl ether	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
m&p-Xylene	**1.2**		0.30	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,3,5-Trimethylbenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,3-Dichlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Carbon tetrachloride	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
2-Hexanone	ND		0.59	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Acetone	ND		1.2	0.35	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Chloroform	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Benzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,1,1-Trichloroethane	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Bromomethane	ND		0.30	0.041	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Chloromethane	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Bromochloromethane	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Chloroethane	ND		0.30	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Vinyl chloride	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Methylene Chloride	ND		0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Carbon disulfide	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Bromoform	ND	*	0.59	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Bromodichloromethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,1-Dichloroethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,1-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Trichlorofluoromethane	ND		0.30	0.041	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Dichlorodifluoromethane	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Freon 113	ND		0.59	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2-Dichloropropane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
2-Butanone	ND		0.59	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,1,2-Trichloroethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
2-Nitropropane	ND	*	0.59	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Trichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Methyl acetate	ND		0.30	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,1,2,2-Tetrachloroethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2,3-Trichlorobenzene	ND		0.59	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
o-Xylene	**0.16**	**J**	0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2-Dichlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50

Client Sample ID: DUP111820
Date Collected: 11/18/20 00:00 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-11
Matrix: Soil
Percent Solids: 79.1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromo-3-Chloropropane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Acetonitrile	ND		5.9	1.5	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Isopropylbenzene	**2.0**		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Chlorodifluoromethane	ND		0.59	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Cyclohexanone	ND		15	1.5	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Ethyl acetate	ND		0.30	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Ethyl ether	ND		0.30	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Isobutyl alcohol	ND		15	2.2	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Naphthalene	**0.31**		0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
n-Butanol	ND		15	3.3	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
n-Butylbenzene	**10**		0.47	0.18	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
n-Heptane	**4.0**		0.47	0.18	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
p-Isopropyltoluene	**2.3**		0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
sec-Butylbenzene	**3.8**		0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
t-Butyl alcohol	ND		5.9	0.89	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
tert-Butylbenzene	**0.087**	**J**	0.30	0.047	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Tetrahydrofuran	ND		0.47	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Xylenes, Total	**1.4**		0.59	0.083	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Pentane, 3-methyl-	*21*	*T J N*	*mg/Kg*	☼	*4.86*	*96-14-0*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Pentane, 2,3-dimethyl-	*17*	*T J N*	*mg/Kg*	☼	*7.20*	*565-59-3*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Hexane, 3-methyl-	*24*	*T J N*	*mg/Kg*	☼	*7.32*	*589-34-4*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Heptane, 3-methyl-	*28*	*T J N*	*mg/Kg*	☼	*9.64*	*589-81-1*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Unknown	*15*	*T J*	*mg/Kg*	☼	*10.13*		*11/19/20 23:03*	*11/25/20 03:08*	*50*
Unknown	*16*	*T J*	*mg/Kg*	☼	*10.39*		*11/19/20 23:03*	*11/25/20 03:08*	*50*
Unknown	*30*	*T J*	*mg/Kg*	☼	*11.12*		*11/19/20 23:03*	*11/25/20 03:08*	*50*
Unknown	*20*	*T J*	*mg/Kg*	☼	*11.23*		*11/19/20 23:03*	*11/25/20 03:08*	*50*
Benzene, 1-ethyl-2,4-dimethyl-	*20*	*T J N*	*mg/Kg*	☼	*13.68*	*874-41-9*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Benzene, 2-ethenyl-1,4-dimethyl-	*15*	*T J N*	*mg/Kg*	☼	*14.30*	*2039-89-6*	*11/19/20 23:03*	*11/25/20 03:08*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*54 - 135*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
4-Bromofluorobenzene (Surr)	*154*	*X*	*50 - 131*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Dibromofluoromethane (Surr)	*93*		*50 - 141*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Toluene-d8 (Surr)	*116*		*52 - 141*	*11/19/20 23:03*	*11/25/20 03:08*	*50*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	**48**		3.0	0.35	mg/Kg	☼	11/19/20 23:03	11/25/20 03:29	500
1,2,4-Trimethylbenzene	**38**		3.0	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 03:29	500

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*54 - 135*	*11/19/20 23:03*	*11/25/20 03:29*	*500*
4-Bromofluorobenzene (Surr)	*145*	*X*	*50 - 131*	*11/19/20 23:03*	*11/25/20 03:29*	*500*
Dibromofluoromethane (Surr)	*86*		*50 - 141*	*11/19/20 23:03*	*11/25/20 03:29*	*500*
Toluene-d8 (Surr)	*107*		*52 - 141*	*11/19/20 23:03*	*11/25/20 03:29*	*500*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: DUP111820
Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-11
Matrix: Soil
Percent Solids: 79.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4,5-Tetrachlorobenzene	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,2'-oxybis[1-chloropropane]	ND		0.054	0.025	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4,5-Trichlorophenol	ND		0.083	0.037	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4,6-Trichlorophenol	ND		0.071	0.033	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4-Dichlorophenol	ND		0.054	0.025	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4-Dimethylphenol	ND		0.083	0.037	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4-Dinitrophenol	ND		1.2	0.42	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4-Dinitrotoluene	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,6-Dinitrotoluene	ND		0.062	0.029	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Chloronaphthalene	ND		0.042	0.0083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Chlorophenol	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Methylnaphthalene	ND		0.042	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Methylphenol	ND		0.083	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Nitroaniline	ND		0.062	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Nitrophenol	ND		0.071	0.033	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
3,3'-Dichlorobenzidine	ND		0.42	0.12	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
3-Nitroaniline	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4,6-Dinitro-2-methylphenol	ND		0.62	0.29	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Bromophenyl-phenylether	ND		0.062	0.029	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Chloro-3-methylphenol	ND		0.062	0.029	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
3,4-Methylphenol	ND		0.062	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Nitroaniline	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Nitrophenol	ND		0.62	0.21	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Acenaphthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Acenaphthylene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Acetophenone	ND		0.062	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Anthracene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Atrazine	ND		0.54	0.25	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzaldehyde	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzo[a]anthracene	ND		0.021	0.0083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzo[a]pyrene	**0.0057**	**J**	0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzo[b]fluoranthene	**0.0074**	**J**	0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzo[g,h,i]perylene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzo[k]fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Bis(2-chloroethoxy)methane	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Bis(2-chloroethyl)ether	ND		0.062	0.029	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Bis(2-ethylhexyl) phthalate	**0.31**		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Butylbenzylphthalate	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Caprolactam	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Carbazole	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Chrysene	**0.0094**	**J**	0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Di-n-butyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Di-n-octyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Dibenz(a,h)anthracene	ND		0.021	0.0083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Dibenzofuran	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Diethyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Dimethyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Fluoranthene	**0.010**	**J**	0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1

Client Sample ID: DUP111820
Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-11
Matrix: Soil
Percent Solids: 79.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloroaniline	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Fluorene	**0.026**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Chlorophenyl-phenyl ether	ND		0.054	0.025	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Hexachlorobenzene	ND		0.021	0.0083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Hexachlorobutadiene	ND		0.096	0.046	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Hexachlorocyclopentadiene	ND		0.62	0.25	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Hexachloroethane	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Isophorone	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
N-Nitrosodi-n-propylamine	ND		0.062	0.029	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
N-Nitrosodiphenylamine	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Naphthalene	ND		0.021	0.0083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Nitrobenzene	ND		0.083	0.033	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Phenanthrene	**0.061**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Aniline	ND		0.62	0.21	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Phenol	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Pyrene	**0.022**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Pentachlorophenol	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzyl alcohol	ND		0.62	0.21	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
n,n'-Dimethylaniline	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Pyridine	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Triethylamine	ND	*- *1	6.2	2.1	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
1,4-Dioxane	ND		0.42	0.12	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*12*	*T J*	*mg/Kg*	☼	*3.24*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*4.7*	*T B J*	*mg/Kg*	☼	*3.85*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, propyl-	*4.2*	*T J N*	*mg/Kg*	☼	*4.97*	*103-65-1*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*4.4*	*T J*	*mg/Kg*	☼	*5.06*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, 1,2,3-trimethyl-	*5.5*	*T J N*	*mg/Kg*	☼	*5.32*	*526-73-8*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Nonane, 3,7-dimethyl-	*3.8*	*T J N*	*mg/Kg*	☼	*5.63*	*17302-32-8*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, 1,2-diethyl-	*4.4*	*T J N*	*mg/Kg*	☼	*5.73*	*135-01-3*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*8.4*	*T J*	*mg/Kg*	☼	*5.80*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, 2-ethyl-1,4-dimethyl-	*4.6*	*T J N*	*mg/Kg*	☼	*5.94*	*1758-88-9*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
1,2,4-Trithiolane	*12*	*T J N*	*mg/Kg*	☼	*6.16*	*289-16-7*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*6.0*	*T J*	*mg/Kg*	☼	*6.24*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, 1,2,4,5-tetramethyl-	*8.7*	*T J N*	*mg/Kg*	☼	*6.26*	*95-93-2*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, 2-ethenyl-1,4-dimethyl-	*5.3*	*T J N*	*mg/Kg*	☼	*6.41*	*2039-89-6*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
1-Phenyl-1-butene	*15*	*T J N*	*mg/Kg*	☼	*6.47*	*824-90-8*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, 1-methyl-4-(1-methylpropyl)-	*7.6*	*T J N*	*mg/Kg*	☼	*6.51*	*1595-16-0*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*6.6*	*T J*	*mg/Kg*	☼	*6.56*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*3.7*	*T J*	*mg/Kg*	☼	*6.61*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*13*	*T J*	*mg/Kg*	☼	*6.75*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Undecane, 3,6-dimethyl-	*5.0*	*T J N*	*mg/Kg*	☼	*6.83*	*17301-28-9*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*4.8*	*T J*	*mg/Kg*	☼	*6.99*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
1H-Indene, 2,3-dihydro-5,6-dimethyl-	*6.0*	*T J N*	*mg/Kg*	☼	*7.10*	*1075-22-5*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*5.1*	*T J*	*mg/Kg*	☼	*7.17*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
1,2,4,5-Tetrathiane	*4.9*	*T J N*	*mg/Kg*	☼	*7.81*	*291-22-5*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*48*	*T J*	*mg/Kg*	☼	*9.31*		*11/21/20 07:13*	*11/30/20 20:19*	*1*

Client Sample ID: DUP111820

Lab Sample ID: 410-21427-11

Date Collected: 11/18/20 00:00 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 79.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	17	T J	mg/Kg	☼	9.73		11/21/20 07:13	11/30/20 20:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	90		45 - 108	11/21/20 07:13	11/30/20 20:19	1
Nitrobenzene-d5 (Surr)	70		32 - 97	11/21/20 07:13	11/30/20 20:19	1
2-Fluorophenol (Surr)	63		26 - 96	11/21/20 07:13	11/30/20 20:19	1
2-Fluorobiphenyl (Surr)	70		39 - 100	11/21/20 07:13	11/30/20 20:19	1
2,4,6-Tribromophenol (Surr)	55		13 - 121	11/21/20 07:13	11/30/20 20:19	1
Phenol-d5 (Surr)	66		27 - 104	11/21/20 07:13	11/30/20 20:19	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**23**		12	4.2	mg/Kg	☼	11/21/20 07:13	11/26/20 16:09	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	81		45 - 108	11/21/20 07:13	11/26/20 16:09	5
Nitrobenzene-d5 (Surr)	68		32 - 97	11/21/20 07:13	11/26/20 16:09	5
2-Fluorophenol (Surr)	66		26 - 96	11/21/20 07:13	11/26/20 16:09	5
2-Fluorobiphenyl (Surr)	68		39 - 100	11/21/20 07:13	11/26/20 16:09	5
2,4,6-Tribromophenol (Surr)	48		13 - 121	11/21/20 07:13	11/26/20 16:09	5
Phenol-d5 (Surr)	69		27 - 104	11/21/20 07:13	11/26/20 16:09	5

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	**0.036**	**J**	0.063	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:47	1
Formaldehyde	**1.2**		0.095	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:47	1
Glutaraldehyde	ND		0.063	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	93		77 - 133	11/22/20 09:12	11/24/20 01:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**20.9**		1.0	1.0	%			11/20/20 00:15	1

Client Sample ID: TB20308

Lab Sample ID: 410-21427-12

Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 13:43	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 13:43	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 13:43	1
1,2,4-Trimethylbenzene	ND		5.0	1.0	ug/L			12/01/20 13:43	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 13:43	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: TB20308
Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-12
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 13:43	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,3,5-Trimethylbenzene	ND		5.0	0.30	ug/L			12/01/20 13:43	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 13:43	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 13:43	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 13:43	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 13:43	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 13:43	1
Acetone	ND		20	0.70	ug/L			12/01/20 13:43	1
Acetonitrile	ND		100	16	ug/L			12/01/20 13:43	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 13:43	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 13:43	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 13:43	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 13:43	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 13:43	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Cyclohexane	ND		5.0	1.0	ug/L			12/01/20 13:43	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 13:43	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 13:43	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 13:43	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/01/20 13:43	1
Freon 113	ND		10	0.20	ug/L			12/01/20 13:43	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 13:43	1
Isopropylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
m&p-Xylene	ND		5.0	1.0	ug/L			12/01/20 13:43	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 13:43	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Methylcyclohexane	ND		5.0	0.50	ug/L			12/01/20 13:43	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 13:43	1
Naphthalene	ND		5.0	1.0	ug/L			12/01/20 13:43	1
n-Butanol	ND		250	61	ug/L			12/01/20 13:43	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 13:43	1
o-Xylene	ND		1.0	0.40	ug/L			12/01/20 13:43	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: TB20308
Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-12
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 13:43	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 13:43	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 13:43	1
Toluene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Xylenes, Total	ND		6.0	1.4	ug/L			12/01/20 13:43	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 13:43*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/20 13:43*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*12/01/20 13:43*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 120*		*12/01/20 13:43*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*12/01/20 13:43*	*1*

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Groundwater

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)	(80-120)
410-21427-1	EB111820W	102	97	99	104
410-21427-2	B55-PDI-SB-03	102	99	97	105
410-21427-3	B55-PDI-SB-04	96	110	93	105
410-21427-3 - DL	B55-PDI-SB-04	100	102	96	105
410-21427-4	B55-PDI-SB-05	101	100	96	105
410-21427-5	B55-PDI-SB-07	101	99	96	104
410-21427-6	B55-PDI-SB-15	102	102	97	104
410-21427-7	B55-PDI-SB-16	102	100	97	105
410-21427-8	B55-PDI-SB-18	100	100	97	105

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Soil

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(54-135)	(50-131)	(50-141)	(52-141)
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	100	95	99	102
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	99	98	100	102
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	101	97	99	102
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	99	98	99	103
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	98	96	98	102
410-21427-10	B55-PDI-SB-10 (9-10)	100	153 X	96	120
410-21427-10 - DL	B55-PDI-SB-10 (9-10)	100	150 X	93	116
410-21427-11	DUP111820	96	154 X	93	116
410-21427-11 - DL	DUP111820	91	145 X	86	107

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(54-135)	(50-131)	(50-141)	(52-141)
LCS 410-69809/5	Lab Control Sample	102	100	100	101
LCS 410-69809/7	Lab Control Sample	106	99	100	100
LCS 410-70130/5	Lab Control Sample	100	91	99	97
LCS 410-70130/7	Lab Control Sample	94	91	92	94
LCSD 410-69809/6	Lab Control Sample Dup	101	100	100	100
LCSD 410-69809/8	Lab Control Sample Dup	102	99	100	101
LCSD 410-70130/6	Lab Control Sample Dup	100	90	98	97

Surrogate Summary

Client: ARCADIS U.S. Inc
Job ID: 410-21427-1
Project/Site: Bristol-Myers Squibb

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(54-135)	(50-131)	(50-141)	(52-141)
LCSD 410-70130/8	Lab Control Sample Dup	97	92	94	96
MB 410-69809/10	Method Blank	105	99	100	101
MB 410-70130/9	Method Blank	98	89	95	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)	(80-120)
410-21427-12	TB20308	102	97	98	104
LCS 410-71355/6	Lab Control Sample	100	103	98	105
LCS 410-71355/7	Lab Control Sample	101	99	96	104
LCS 410-71948/8	Lab Control Sample	99	103	98	106
MB 410-71355/9	Method Blank	101	98	98	105
MB 410-71948/12	Method Blank	100	97	98	104

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Groundwater **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(10-150)	(44-102)	(10-84)	(23-128)	(31-113)	(10-67)
410-21427-1	EB111820W	83	74	48	75	87	36
410-21427-2	B55-PDI-SB-03	85	78	53	79	59	40
410-21427-3	B55-PDI-SB-04	79	71	54	76	43	45
410-21427-3 - DL	B55-PDI-SB-04	79	85	58	87	48	51
410-21427-4	B55-PDI-SB-05	51	59	24	61	32	22
410-21427-5	B55-PDI-SB-07	61	74	22	75	41	22
410-21427-6	B55-PDI-SB-15	85	76	47	77	59	37
410-21427-7	B55-PDI-SB-16	67	93	45	88	63	37
410-21427-8	B55-PDI-SB-18	77	76	48	77	60	37

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Surrogate Summary

Client: ARCADIS U.S. Inc
Job ID: 410-21427-1
Project/Site: Bristol-Myers Squibb

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Soil — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	TPHd14 (45-108)	NBZ (32-97)	2FP (26-96)	FBP (39-100)	TBP (13-121)	PHL (27-104)
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	102	72	86	79	83	93
410-21427-9 - DL	B55-PDI-SB-22 (5.2-6.2)	89	65	75	75	70	78
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	90	58	65	71	65	75
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	101	74	83	84	78	89
410-21427-10	B55-PDI-SB-10 (9-10)	86	68	66	74	76	70
410-21427-10 - DL	B55-PDI-SB-10 (9-10)	78	66	57	69	58	62
410-21427-11 - DL	DUP111820	81	68	66	68	48	69
410-21427-11	DUP111820	90	70	63	70	55	66

Surrogate Legend

TPHd14 = p-Terphenyl-d14 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
2FP = 2-Fluorophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	TBP (13-121)	FBP (39-100)	2FP (26-96)	NBZ (32-97)	TPHd14 (45-108)	PHL (27-104)
LCS 410-68893/2-A	Lab Control Sample	89	77	68	62	93	74
LCS 410-68893/7-A	Lab Control Sample	94	86	79	67	100	82
LCSD 410-68893/8-A	Lab Control Sample Dup	99	90	83	72	109 S1+	85
MB 410-68893/1-A	Method Blank	95	90	84	73	107	86

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	TBP (10-150)	FBP (44-102)	2FP (10-84)	NBZ (23-128)	TPHd14 (31-113)	PHL (10-67)
LCS 410-70315/2-A	Lab Control Sample	89	78	56	82	90	44
LCS 410-70315/3-A	Lab Control Sample	89	73	56	81	93	45
LCSD 410-70315/4-A	Lab Control Sample Dup	87	70	54	79	89	44
MB 410-70315/1-A	Method Blank	71	56	40	56	81	31

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)

Surrogate Summary

Client: ARCADIS U.S. Inc
Job ID: 410-21427-1
Project/Site: Bristol-Myers Squibb

TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Groundwater — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BTRA
Lab Sample ID	Client Sample ID	(39-153)
410-21427-1	EB111820W	98
410-21427-2	B55-PDI-SB-03	102
410-21427-3	B55-PDI-SB-04	107
410-21427-4	B55-PDI-SB-05	93
410-21427-5	B55-PDI-SB-07	88
410-21427-6	B55-PDI-SB-15	89
410-21427-7	B55-PDI-SB-16	94
410-21427-8	B55-PDI-SB-18	94

Surrogate Legend
BTRA = Butyraldehyde

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Soil — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BTRA
Lab Sample ID	Client Sample ID	(77-133)
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	101
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	100
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	101
410-21427-10	B55-PDI-SB-10 (9-10)	103
410-21427-11	DUP111820	93

Surrogate Legend
BTRA = Butyraldehyde

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BTRA
Lab Sample ID	Client Sample ID	(77-133)
LCS 410-68967/2-A	Lab Control Sample	103
MB 410-68967/1-A	Method Blank	101

Surrogate Legend
BTRA = Butyraldehyde

Method: 8315A - Carbonyl Compounds by HPLC

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BTRA
Lab Sample ID	Client Sample ID	(39-153)
LCS 410-68417/2-A	Lab Control Sample	97
LCSD 410-68417/3-A	Lab Control Sample Dup	94
MB 410-68417/1-A	Method Blank	98

Surrogate Legend
BTRA = Butyraldehyde

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: 410-21427-9 MS
Matrix: Soil
Analysis Batch: 69809

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68357

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	ND		0.0186	0.0182		mg/Kg	☼	98	69 - 123
1,1,2,2-Tetrachloroethane	ND		0.0186	0.0172		mg/Kg	☼	93	69 - 125
1,1,2-Trichloroethane	ND		0.0186	0.0180		mg/Kg	☼	97	80 - 120
1,1-Dichloroethane	ND		0.0186	0.0189		mg/Kg	☼	102	79 - 120
1,1-Dichloroethene	ND		0.0186	0.0211		mg/Kg	☼	114	73 - 129
1,2,3-Trichlorobenzene	ND		0.0186	0.0136		mg/Kg	☼	73	57 - 131
1,2,4-Trichlorobenzene	ND		0.0186	0.0131		mg/Kg	☼	70	56 - 130
1,2,4-Trimethylbenzene	ND	F1	0.0186	0.0128	F1	mg/Kg	☼	69	73 - 120
1,2-Dibromo-3-Chloropropane	ND		0.0186	0.0162		mg/Kg	☼	87	48 - 134
1,2-Dibromoethane	ND		0.0186	0.0165		mg/Kg	☼	89	76 - 120
1,2-Dichlorobenzene	ND		0.0186	0.0143		mg/Kg	☼	77	76 - 120
1,2-Dichloroethane	ND		0.0186	0.0178		mg/Kg	☼	96	71 - 128
1,2-Dichloropropane	ND		0.0186	0.0180		mg/Kg	☼	97	80 - 120
1,3,5-Trimethylbenzene	ND	F1	0.0186	0.0122	F1	mg/Kg	☼	66	73 - 120
1,3-Dichlorobenzene	ND	F1	0.0186	0.0132	F1	mg/Kg	☼	71	75 - 120
1,4-Dichlorobenzene	ND	F1	0.0186	0.0134	F1	mg/Kg	☼	72	80 - 120
1,4-Dioxane	ND		0.464	0.492		mg/Kg	☼	106	62 - 131
2-Butanone	0.0020	J	0.139	0.157		mg/Kg	☼	112	57 - 128
2-Hexanone	ND		0.0928	0.106		mg/Kg	☼	114	54 - 140
2-Nitropropane	ND		0.0186	0.0166		mg/Kg	☼	89	27 - 183
4-Methyl-2-pentanone	ND		0.0928	0.0883		mg/Kg	☼	95	67 - 128
Acetone	0.028	F1	0.139	0.274	F1	mg/Kg	☼	176	41 - 150
Benzene	ND		0.0186	0.0172		mg/Kg	☼	93	80 - 120
Bromochloromethane	ND		0.0186	0.0182		mg/Kg	☼	98	72 - 124
Bromodichloromethane	ND		0.0186	0.0172		mg/Kg	☼	93	70 - 120
Bromoform	ND		0.0186	0.0149		mg/Kg	☼	80	51 - 127
Bromomethane	ND		0.0186	0.0228		mg/Kg	☼	123	45 - 140
Carbon disulfide	0.00070	J	0.0186	0.0190		mg/Kg	☼	98	64 - 133
Carbon tetrachloride	ND		0.0186	0.0172		mg/Kg	☼	93	64 - 134
Chlorobenzene	ND	F1	0.0186	0.0146	F1	mg/Kg	☼	79	80 - 120
Chloroethane	ND		0.0186	0.0214		mg/Kg	☼	115	43 - 135
Chloroform	ND		0.0186	0.0186		mg/Kg	☼	101	80 - 120
Chloromethane	ND		0.0186	0.0214		mg/Kg	☼	115	56 - 120
cis-1,2-Dichloroethene	ND		0.0186	0.0192		mg/Kg	☼	103	80 - 123
cis-1,3-Dichloropropene	ND		0.0186	0.0157		mg/Kg	☼	85	66 - 120
Cyclohexane	ND		0.0186	0.0189		mg/Kg	☼	102	58 - 126
Cyclohexanone	ND		0.464	0.421		mg/Kg	☼	91	47 - 136
Dibromochloromethane	ND		0.0186	0.0166		mg/Kg	☼	89	69 - 125
Dichlorodifluoromethane	ND		0.0186	0.0207		mg/Kg	☼	112	21 - 127
Ethylbenzene	ND	F1	0.0186	0.0131	F1	mg/Kg	☼	70	78 - 120
Freon 113	ND		0.0186	0.0195		mg/Kg	☼	105	64 - 135
Isobutyl alcohol	ND		0.464	0.459		mg/Kg	☼	99	69 - 129
Isopropylbenzene	ND	F1	0.0186	0.0119	F1	mg/Kg	☼	64	77 - 120
m&p-Xylene	ND	F1	0.0371	0.0258	F1	mg/Kg	☼	69	80 - 120
Methyl acetate	ND		0.0186	0.0164		mg/Kg	☼	88	67 - 128
Methyl tertiary butyl ether	ND		0.0186	0.0178		mg/Kg	☼	96	72 - 120
Methylcyclohexane	ND		0.0186	0.0174		mg/Kg	☼	94	61 - 124
Methylene Chloride	ND		0.0186	0.0185		mg/Kg	☼	99	76 - 122

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 410-21427-9 MS
Matrix: Soil
Analysis Batch: 69809

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68357

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	ND		0.0186	0.0154		mg/Kg	☼	83	48 - 130
n-Butanol	ND		0.928	0.894		mg/Kg	☼	96	63 - 123
n-Butylbenzene	ND	F1	0.0186	0.00804	F1	mg/Kg	☼	43	71 - 121
n-Heptane	ND		0.0186	0.0163		mg/Kg	☼	88	50 - 141
o-Xylene	ND	F1	0.0186	0.0136	F1	mg/Kg	☼	74	75 - 120
p-Isopropyltoluene	ND	F1	0.0186	0.00980	F1	mg/Kg	☼	53	72 - 120
sec-Butylbenzene	ND	F1	0.0186	0.00954	F1	mg/Kg	☼	51	72 - 120
Styrene	ND	F1	0.0186	0.0133	F1	mg/Kg	☼	72	76 - 120
t-Butyl alcohol	ND		0.186	0.211		mg/Kg	☼	114	74 - 121
tert-Butylbenzene	ND	F1	0.0186	0.0108	F1	mg/Kg	☼	58	68 - 120
Tetrachloroethene	ND		0.0186	0.0137		mg/Kg	☼	74	73 - 120
Tetrahydrofuran	ND		0.0928	0.0988		mg/Kg	☼	106	71 - 127
Toluene	ND		0.0186	0.0160		mg/Kg	☼	86	80 - 120
trans-1,2-Dichloroethene	ND		0.0186	0.0182		mg/Kg	☼	98	80 - 125
trans-1,3-Dichloropropene	ND		0.0186	0.0153		mg/Kg	☼	83	68 - 122
Trichloroethene	ND		0.0186	0.0161		mg/Kg	☼	87	80 - 120
Trichlorofluoromethane	ND		0.0186	0.0216		mg/Kg	☼	116	55 - 134
Vinyl chloride	ND		0.0186	0.0220		mg/Kg	☼	119	52 - 120
Xylenes, Total	ND	F1	0.0557	0.0394	F1	mg/Kg	☼	71	75 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*54 - 135*
4-Bromofluorobenzene (Surr)	*98*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*102*		*52 - 141*

Lab Sample ID: 410-21427-9 MS
Matrix: Soil
Analysis Batch: 69809

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68357

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetonitrile	ND		0.142	0.130		mg/Kg	☼	92	61 - 120
Chlorodifluoromethane	ND	F1	0.0190	0.0283	F1	mg/Kg	☼	149	60 - 133
Ethyl acetate	ND		0.0190	0.0170		mg/Kg	☼	90	65 - 133
Ethyl ether	ND		0.0190	0.0214		mg/Kg	☼	113	59 - 135

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*54 - 135*
4-Bromofluorobenzene (Surr)	*97*		*50 - 131*
Dibromofluoromethane (Surr)	*99*		*50 - 141*
Toluene-d8 (Surr)	*102*		*52 - 141*

Lab Sample ID: 410-21427-9 MSD
Matrix: Soil
Analysis Batch: 69809

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68357

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	ND		0.0177	0.0189		mg/Kg	☼	107	69 - 123	4	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 410-21427-9 MSD
Matrix: Soil
Analysis Batch: 69809

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68357

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,2,2-Tetrachloroethane	ND		0.0177	0.0176		mg/Kg	☼	99	69 - 125	2	30
1,1,2-Trichloroethane	ND		0.0177	0.0184		mg/Kg	☼	104	80 - 120	2	30
1,1-Dichloroethane	ND		0.0177	0.0195		mg/Kg	☼	110	79 - 120	3	30
1,1-Dichloroethene	ND		0.0177	0.0210		mg/Kg	☼	118	73 - 129	0	30
1,2,3-Trichlorobenzene	ND		0.0177	0.0145		mg/Kg	☼	82	57 - 131	7	30
1,2,4-Trichlorobenzene	ND		0.0177	0.0139		mg/Kg	☼	78	56 - 130	6	30
1,2,4-Trimethylbenzene	ND	F1	0.0177	0.0147		mg/Kg	☼	83	73 - 120	13	30
1,2-Dibromo-3-Chloropropane	ND		0.0177	0.0162		mg/Kg	☼	91	48 - 134	0	30
1,2-Dibromoethane	ND		0.0177	0.0169		mg/Kg	☼	95	76 - 120	2	30
1,2-Dichlorobenzene	ND		0.0177	0.0156		mg/Kg	☼	88	76 - 120	9	30
1,2-Dichloroethane	ND		0.0177	0.0181		mg/Kg	☼	102	71 - 128	2	30
1,2-Dichloropropane	ND		0.0177	0.0184		mg/Kg	☼	104	80 - 120	2	30
1,3,5-Trimethylbenzene	ND	F1	0.0177	0.0143		mg/Kg	☼	80	73 - 120	16	30
1,3-Dichlorobenzene	ND	F1	0.0177	0.0147		mg/Kg	☼	83	75 - 120	10	30
1,4-Dichlorobenzene	ND	F1	0.0177	0.0145		mg/Kg	☼	82	80 - 120	8	30
1,4-Dioxane	ND		0.444	0.563		mg/Kg	☼	127	62 - 131	14	30
2-Butanone	0.0020	J	0.133	0.151		mg/Kg	☼	112	57 - 128	4	30
2-Hexanone	ND		0.0887	0.108		mg/Kg	☼	122	54 - 140	2	30
2-Nitropropane	ND		0.0177	0.0188		mg/Kg	☼	106	27 - 183	13	30
4-Methyl-2-pentanone	ND		0.0887	0.0869		mg/Kg	☼	98	67 - 128	2	30
Acetone	0.028	F1	0.133	0.292	F1	mg/Kg	☼	198	41 - 150	6	30
Benzene	ND		0.0177	0.0181		mg/Kg	☼	102	80 - 120	5	30
Bromochloromethane	ND		0.0177	0.0181		mg/Kg	☼	102	72 - 124	0	30
Bromodichloromethane	ND		0.0177	0.0175		mg/Kg	☼	99	70 - 120	2	30
Bromoform	ND		0.0177	0.0152		mg/Kg	☼	85	51 - 127	2	30
Bromomethane	ND		0.0177	0.0217		mg/Kg	☼	122	45 - 140	5	30
Carbon disulfide	0.00070	J	0.0177	0.0191		mg/Kg	☼	104	64 - 133	1	30
Carbon tetrachloride	ND		0.0177	0.0182		mg/Kg	☼	102	64 - 134	5	30
Chlorobenzene	ND	F1	0.0177	0.0158		mg/Kg	☼	89	80 - 120	8	30
Chloroethane	ND		0.0177	0.0205		mg/Kg	☼	115	43 - 135	4	30
Chloroform	ND		0.0177	0.0191		mg/Kg	☼	108	80 - 120	3	30
Chloromethane	ND		0.0177	0.0181		mg/Kg	☼	102	56 - 120	16	30
cis-1,2-Dichloroethene	ND		0.0177	0.0194		mg/Kg	☼	110	80 - 123	1	30
cis-1,3-Dichloropropene	ND		0.0177	0.0163		mg/Kg	☼	92	66 - 120	3	30
Cyclohexane	ND		0.0177	0.0196		mg/Kg	☼	110	58 - 126	3	30
Cyclohexanone	ND		0.444	0.417		mg/Kg	☼	94	47 - 136	1	30
Dibromochloromethane	ND		0.0177	0.0173		mg/Kg	☼	98	69 - 125	4	30
Dichlorodifluoromethane	ND		0.0177	0.0193		mg/Kg	☼	109	21 - 127	7	30
Ethylbenzene	ND	F1	0.0177	0.0149		mg/Kg	☼	84	78 - 120	13	30
Freon 113	ND		0.0177	0.0195		mg/Kg	☼	110	64 - 135	0	30
Isobutyl alcohol	ND		0.444	0.471		mg/Kg	☼	106	69 - 129	3	30
Isopropylbenzene	ND	F1	0.0177	0.0141		mg/Kg	☼	79	77 - 120	17	30
m&p-Xylene	ND	F1	0.0355	0.0294		mg/Kg	☼	83	80 - 120	13	30
Methyl acetate	ND		0.0177	0.0152		mg/Kg	☼	86	67 - 128	7	30
Methyl tertiary butyl ether	ND		0.0177	0.0177		mg/Kg	☼	100	72 - 120	0	30
Methylcyclohexane	ND		0.0177	0.0174		mg/Kg	☼	98	61 - 124	0	30
Methylene Chloride	ND		0.0177	0.0186		mg/Kg	☼	105	76 - 122	1	30
Naphthalene	ND		0.0177	0.0159		mg/Kg	☼	89	48 - 130	3	30
n-Butanol	ND		0.887	0.989		mg/Kg	☼	111	63 - 123	10	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 410-21427-9 MSD
Matrix: Soil
Analysis Batch: 69809

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68357

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
n-Butylbenzene	ND	F1	0.0177	0.00996	F1	mg/Kg	☼	56	71 - 121	21	30
n-Heptane	ND		0.0177	0.0178		mg/Kg	☼	100	50 - 141	9	30
o-Xylene	ND	F1	0.0177	0.0155		mg/Kg	☼	88	75 - 120	13	30
p-Isopropyltoluene	ND	F1	0.0177	0.0120	F1	mg/Kg	☼	68	72 - 120	20	30
sec-Butylbenzene	ND	F1	0.0177	0.0119	F1	mg/Kg	☼	67	72 - 120	22	30
Styrene	ND	F1	0.0177	0.0148		mg/Kg	☼	83	76 - 120	11	30
t-Butyl alcohol	ND		0.177	0.208		mg/Kg	☼	117	74 - 121	1	30
tert-Butylbenzene	ND	F1	0.0177	0.0127		mg/Kg	☼	72	68 - 120	17	30
Tetrachloroethene	ND		0.0177	0.0158		mg/Kg	☼	89	73 - 120	14	30
Tetrahydrofuran	ND		0.0887	0.110		mg/Kg	☼	124	71 - 127	11	30
Toluene	ND		0.0177	0.0172		mg/Kg	☼	97	80 - 120	7	30
trans-1,2-Dichloroethene	ND		0.0177	0.0191		mg/Kg	☼	107	80 - 125	5	30
trans-1,3-Dichloropropene	ND		0.0177	0.0160		mg/Kg	☼	90	68 - 122	4	30
Trichloroethene	ND		0.0177	0.0170		mg/Kg	☼	96	80 - 120	6	30
Trichlorofluoromethane	ND		0.0177	0.0203		mg/Kg	☼	115	55 - 134	6	30
Vinyl chloride	ND		0.0177	0.0201		mg/Kg	☼	113	52 - 120	9	30
Xylenes, Total	ND	F1	0.0532	0.0449		mg/Kg	☼	84	75 - 120	13	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*54 - 135*
4-Bromofluorobenzene (Surr)	*98*		*50 - 131*
Dibromofluoromethane (Surr)	*99*		*50 - 141*
Toluene-d8 (Surr)	*103*		*52 - 141*

Lab Sample ID: 410-21427-9 MSD
Matrix: Soil
Analysis Batch: 69809

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68357

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetonitrile	ND		0.135	0.147		mg/Kg	☼	109	61 - 120	12	30
Chlorodifluoromethane	ND	F1	0.0181	0.0305	F1	mg/Kg	☼	169	60 - 133	7	30
Ethyl acetate	ND		0.0181	0.0154		mg/Kg	☼	86	65 - 133	9	30
Ethyl ether	ND		0.0181	0.0201		mg/Kg	☼	111	59 - 135	6	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*54 - 135*
4-Bromofluorobenzene (Surr)	*96*		*50 - 131*
Dibromofluoromethane (Surr)	*98*		*50 - 141*
Toluene-d8 (Surr)	*102*		*52 - 141*

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
1,2,4-Trimethylbenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2-Dichloroethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
1,4-Dichlorobenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
1,4-Dioxane	ND		0.25	0.037	mg/Kg			11/24/20 11:24	1
4-Methyl-2-pentanone	ND		0.010	0.0010	mg/Kg			11/24/20 11:24	1
1,3,5-Trimethylbenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,3-Dichlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
2-Hexanone	ND		0.010	0.0010	mg/Kg			11/24/20 11:24	1
Acetone	ND		0.020	0.0060	mg/Kg			11/24/20 11:24	1
Benzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1,1-Trichloroethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Bromomethane	ND		0.0050	0.00070	mg/Kg			11/24/20 11:24	1
Carbon tetrachloride	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Chlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Bromochloromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Chloroethane	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Chloroform	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Chloromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Carbon disulfide	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
cis-1,2-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Bromoform	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
cis-1,3-Dichloropropene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Bromodichloromethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Cyclohexane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1-Dichloroethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,1-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Dibromochloromethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Dichlorodifluoromethane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
1,2-Dichloropropane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Ethylbenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
2-Butanone	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
Freon 113	ND		0.010	0.00060	mg/Kg			11/24/20 11:24	1
1,1,2-Trichloroethane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
2-Nitropropane	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
m&p-Xylene	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Methyl acetate	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
1,1,2,2-Tetrachloroethane	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Methyl tertiary butyl ether	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2,3-Trichlorobenzene	ND		0.010	0.0050	mg/Kg			11/24/20 11:24	1
Methylcyclohexane	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
Methylene Chloride	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
1,2-Dichlorobenzene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
1,2-Dibromo-3-Chloropropane	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Acetonitrile	ND		0.10	0.025	mg/Kg			11/24/20 11:24	1
Isopropylbenzene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
o-Xylene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Chlorodifluoromethane	ND		0.010	0.0020	mg/Kg			11/24/20 11:24	1
Styrene	ND		0.0050	0.00040	mg/Kg			11/24/20 11:24	1
Cyclohexanone	ND		0.25	0.025	mg/Kg			11/24/20 11:24	1
Ethyl acetate	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-69809/10
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethyl ether	ND		0.0050	0.0010	mg/Kg			11/24/20 11:24	1
Tetrachloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Isobutyl alcohol	ND		0.25	0.038	mg/Kg			11/24/20 11:24	1
Naphthalene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
Toluene	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
n-Butanol	ND		0.25	0.056	mg/Kg			11/24/20 11:24	1
trans-1,2-Dichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
n-Butylbenzene	ND		0.0080	0.0030	mg/Kg			11/24/20 11:24	1
trans-1,3-Dichloropropene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
n-Heptane	ND		0.0080	0.0030	mg/Kg			11/24/20 11:24	1
Trichloroethene	ND		0.0050	0.00050	mg/Kg			11/24/20 11:24	1
Trichlorofluoromethane	ND		0.0050	0.00070	mg/Kg			11/24/20 11:24	1
p-Isopropyltoluene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
Vinyl chloride	ND		0.0050	0.00060	mg/Kg			11/24/20 11:24	1
sec-Butylbenzene	ND		0.0050	0.0020	mg/Kg			11/24/20 11:24	1
t-Butyl alcohol	ND		0.10	0.015	mg/Kg			11/24/20 11:24	1
tert-Butylbenzene	ND		0.0050	0.00080	mg/Kg			11/24/20 11:24	1
Tetrahydrofuran	ND		0.0080	0.0010	mg/Kg			11/24/20 11:24	1
Xylenes, Total	ND		0.010	0.0014	mg/Kg			11/24/20 11:24	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*					*11/24/20 11:24*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*54 - 135*		*11/24/20 11:24*	*1*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*		*11/24/20 11:24*	*1*
Dibromofluoromethane (Surr)	*100*		*50 - 141*		*11/24/20 11:24*	*1*
Toluene-d8 (Surr)	*101*		*52 - 141*		*11/24/20 11:24*	*1*

Lab Sample ID: LCS 410-69809/5
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	0.0200	0.0215		mg/Kg		107	76 - 120
1,2,4-Trimethylbenzene	0.0200	0.0223		mg/Kg		111	73 - 120
1,2-Dichloroethane	0.0200	0.0215		mg/Kg		107	71 - 128
1,2,4-Trichlorobenzene	0.0200	0.0219		mg/Kg		109	56 - 130
1,4-Dichlorobenzene	0.0200	0.0216		mg/Kg		108	80 - 120
1,4-Dioxane	0.500	0.559		mg/Kg		112	62 - 131
4-Methyl-2-pentanone	0.100	0.109		mg/Kg		109	67 - 128
1,3,5-Trimethylbenzene	0.0200	0.0222		mg/Kg		111	73 - 120
1,3-Dichlorobenzene	0.0200	0.0217		mg/Kg		109	75 - 120
2-Hexanone	0.100	0.108		mg/Kg		108	54 - 140
Acetone	0.150	0.142		mg/Kg		95	41 - 150
Benzene	0.0200	0.0211		mg/Kg		105	80 - 120
1,1,1-Trichloroethane	0.0200	0.0212		mg/Kg		106	69 - 123
Bromomethane	0.0200	0.0219		mg/Kg		110	45 - 140

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69809/5
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon tetrachloride	0.0200	0.0211		mg/Kg		105	64 - 134
Chlorobenzene	0.0200	0.0212		mg/Kg		106	80 - 120
Bromochloromethane	0.0200	0.0210		mg/Kg		105	72 - 124
Chloroethane	0.0200	0.0205		mg/Kg		102	43 - 135
Chloroform	0.0200	0.0217		mg/Kg		109	80 - 120
Chloromethane	0.0200	0.0178		mg/Kg		89	56 - 120
Carbon disulfide	0.0200	0.0214		mg/Kg		107	64 - 133
cis-1,2-Dichloroethene	0.0200	0.0222		mg/Kg		111	80 - 125
Bromoform	0.0200	0.0195		mg/Kg		98	51 - 127
cis-1,3-Dichloropropene	0.0200	0.0210		mg/Kg		105	66 - 120
Bromodichloromethane	0.0200	0.0208		mg/Kg		104	70 - 120
Cyclohexane	0.0200	0.0209		mg/Kg		105	58 - 126
1,1-Dichloroethane	0.0200	0.0214		mg/Kg		107	79 - 120
1,1-Dichloroethene	0.0200	0.0226		mg/Kg		113	73 - 129
Dibromochloromethane	0.0200	0.0212		mg/Kg		106	69 - 125
Dichlorodifluoromethane	0.0200	0.0144		mg/Kg		72	21 - 127
1,2-Dichloropropane	0.0200	0.0218		mg/Kg		109	80 - 120
Ethylbenzene	0.0200	0.0217		mg/Kg		109	78 - 120
2-Butanone	0.150	0.155		mg/Kg		104	57 - 128
Freon 113	0.0200	0.0189		mg/Kg		95	64 - 135
1,1,2-Trichloroethane	0.0200	0.0219		mg/Kg		110	80 - 120
2-Nitropropane	0.0200	0.0166		mg/Kg		83	27 - 183
m&p-Xylene	0.0400	0.0432		mg/Kg		108	80 - 120
Methyl acetate	0.0200	0.0193		mg/Kg		97	67 - 128
1,1,2,2-Tetrachloroethane	0.0200	0.0217		mg/Kg		109	69 - 125
Methyl tertiary butyl ether	0.0200	0.0213		mg/Kg		106	72 - 120
1,2,3-Trichlorobenzene	0.0200	0.0221		mg/Kg		111	57 - 131
Methylcyclohexane	0.0200	0.0195		mg/Kg		98	61 - 124
Methylene Chloride	0.0200	0.0209		mg/Kg		104	76 - 122
1,2-Dichlorobenzene	0.0200	0.0216		mg/Kg		108	76 - 120
1,2-Dibromo-3-Chloropropane	0.0200	0.0206		mg/Kg		103	48 - 134
Isopropylbenzene	0.0200	0.0224		mg/Kg		112	77 - 120
o-Xylene	0.0200	0.0211		mg/Kg		106	75 - 120
Styrene	0.0200	0.0207		mg/Kg		104	76 - 120
Cyclohexanone	0.500	0.379		mg/Kg		76	47 - 136
Tetrachloroethene	0.0200	0.0208		mg/Kg		104	73 - 120
Isobutyl alcohol	0.500	0.519		mg/Kg		104	69 - 129
Naphthalene	0.0200	0.0218		mg/Kg		109	48 - 130
Toluene	0.0200	0.0214		mg/Kg		107	80 - 120
n-Butanol	1.00	1.01		mg/Kg		101	63 - 123
trans-1,2-Dichloroethene	0.0200	0.0216		mg/Kg		108	80 - 126
n-Butylbenzene	0.0200	0.0207		mg/Kg		103	71 - 121
trans-1,3-Dichloropropene	0.0200	0.0209		mg/Kg		104	68 - 122
n-Heptane	0.0200	0.0210		mg/Kg		105	50 - 141
Trichloroethene	0.0200	0.0213		mg/Kg		106	80 - 120
Trichlorofluoromethane	0.0200	0.0186		mg/Kg		93	55 - 134
p-Isopropyltoluene	0.0200	0.0219		mg/Kg		109	72 - 120
Vinyl chloride	0.0200	0.0182		mg/Kg		91	52 - 120
sec-Butylbenzene	0.0200	0.0215		mg/Kg		108	72 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-69809/5
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
t-Butyl alcohol	0.200	0.207		mg/Kg		103	74 - 121
tert-Butylbenzene	0.0200	0.0200		mg/Kg		100	68 - 120
Tetrahydrofuran	0.100	0.104		mg/Kg		104	71 - 127
Xylenes, Total	0.0600	0.0643		mg/Kg		107	75 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*54 - 135*
4-Bromofluorobenzene (Surr)	*100*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*101*		*52 - 141*

Lab Sample ID: LCS 410-69809/7
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetonitrile	0.150	0.127		mg/Kg		85	61 - 120
Chlorodifluoromethane	0.0200	0.0182		mg/Kg		91	60 - 133
Ethyl acetate	0.0200	0.0237		mg/Kg		118	65 - 133
Ethyl ether	0.0200	0.0252		mg/Kg		126	59 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*106*		*54 - 135*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*100*		*52 - 141*

Lab Sample ID: LCSD 410-69809/6
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane	0.0200	0.0206		mg/Kg		103	76 - 120	4	30
1,2,4-Trimethylbenzene	0.0200	0.0217		mg/Kg		109	73 - 120	2	30
1,2-Dichloroethane	0.0200	0.0204		mg/Kg		102	71 - 128	5	30
1,2,4-Trichlorobenzene	0.0200	0.0213		mg/Kg		106	56 - 130	3	30
1,4-Dichlorobenzene	0.0200	0.0208		mg/Kg		104	80 - 120	4	30
1,4-Dioxane	0.500	0.498		mg/Kg		100	62 - 131	12	30
4-Methyl-2-pentanone	0.100	0.102		mg/Kg		102	67 - 128	7	30
1,3,5-Trimethylbenzene	0.0200	0.0216		mg/Kg		108	73 - 120	3	30
1,3-Dichlorobenzene	0.0200	0.0207		mg/Kg		103	75 - 120	5	30
2-Hexanone	0.100	0.101		mg/Kg		101	54 - 140	7	30
Acetone	0.150	0.142		mg/Kg		95	41 - 150	0	30
Benzene	0.0200	0.0206		mg/Kg		103	80 - 120	2	30
1,1,1-Trichloroethane	0.0200	0.0208		mg/Kg		104	69 - 123	2	30
Bromomethane	0.0200	0.0210		mg/Kg		105	45 - 140	4	30
Carbon tetrachloride	0.0200	0.0207		mg/Kg		104	64 - 134	2	30
Chlorobenzene	0.0200	0.0208		mg/Kg		104	80 - 120	2	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69809/6
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bromochloromethane	0.0200	0.0201		mg/Kg		101	72 - 124	4	30
Chloroethane	0.0200	0.0201		mg/Kg		100	43 - 135	2	30
Chloroform	0.0200	0.0208		mg/Kg		104	80 - 120	4	30
Chloromethane	0.0200	0.0174		mg/Kg		87	56 - 120	2	30
Carbon disulfide	0.0200	0.0208		mg/Kg		104	64 - 133	3	30
cis-1,2-Dichloroethene	0.0200	0.0220		mg/Kg		110	80 - 125	1	30
Bromoform	0.0200	0.0183		mg/Kg		91	51 - 127	7	30
cis-1,3-Dichloropropene	0.0200	0.0201		mg/Kg		101	66 - 120	4	30
Bromodichloromethane	0.0200	0.0204		mg/Kg		102	70 - 120	2	30
Cyclohexane	0.0200	0.0208		mg/Kg		104	58 - 126	0	30
1,1-Dichloroethane	0.0200	0.0210		mg/Kg		105	79 - 120	2	30
1,1-Dichloroethene	0.0200	0.0223		mg/Kg		112	73 - 129	1	30
Dibromochloromethane	0.0200	0.0205		mg/Kg		102	69 - 125	3	30
Dichlorodifluoromethane	0.0200	0.0140		mg/Kg		70	21 - 127	3	30
1,2-Dichloropropane	0.0200	0.0211		mg/Kg		105	80 - 120	3	30
Ethylbenzene	0.0200	0.0212		mg/Kg		106	78 - 120	2	30
2-Butanone	0.150	0.144		mg/Kg		96	57 - 128	8	30
Freon 113	0.0200	0.0191		mg/Kg		96	64 - 135	1	30
1,1,2-Trichloroethane	0.0200	0.0211		mg/Kg		106	80 - 120	4	30
2-Nitropropane	0.0200	0.0181		mg/Kg		91	27 - 183	8	30
m&p-Xylene	0.0400	0.0419		mg/Kg		105	80 - 120	3	30
Methyl acetate	0.0200	0.0177		mg/Kg		89	67 - 128	9	30
1,1,2,2-Tetrachloroethane	0.0200	0.0203		mg/Kg		102	69 - 125	7	30
Methyl tertiary butyl ether	0.0200	0.0200		mg/Kg		100	72 - 120	6	30
1,2,3-Trichlorobenzene	0.0200	0.0211		mg/Kg		106	57 - 131	5	30
Methylcyclohexane	0.0200	0.0192		mg/Kg		96	61 - 124	2	30
Methylene Chloride	0.0200	0.0206		mg/Kg		103	76 - 122	1	30
1,2-Dichlorobenzene	0.0200	0.0209		mg/Kg		105	76 - 120	3	30
1,2-Dibromo-3-Chloropropane	0.0200	0.0196		mg/Kg		98	48 - 134	5	30
Isopropylbenzene	0.0200	0.0219		mg/Kg		109	77 - 120	2	30
o-Xylene	0.0200	0.0205		mg/Kg		103	75 - 120	3	30
Styrene	0.0200	0.0201		mg/Kg		101	76 - 120	3	30
Cyclohexanone	0.500	0.354		mg/Kg		71	47 - 136	7	30
Tetrachloroethene	0.0200	0.0205		mg/Kg		102	73 - 120	2	30
Isobutyl alcohol	0.500	0.490		mg/Kg		98	69 - 129	6	30
Naphthalene	0.0200	0.0204		mg/Kg		102	48 - 130	7	30
Toluene	0.0200	0.0206		mg/Kg		103	80 - 120	4	30
n-Butanol	1.00	0.938		mg/Kg		94	63 - 123	7	30
trans-1,2-Dichloroethene	0.0200	0.0212		mg/Kg		106	80 - 126	2	30
n-Butylbenzene	0.0200	0.0203		mg/Kg		101	71 - 121	2	30
trans-1,3-Dichloropropene	0.0200	0.0202		mg/Kg		101	68 - 122	3	30
n-Heptane	0.0200	0.0208		mg/Kg		104	50 - 141	1	30
Trichloroethene	0.0200	0.0209		mg/Kg		104	80 - 120	2	30
Trichlorofluoromethane	0.0200	0.0183		mg/Kg		92	55 - 134	2	30
p-Isopropyltoluene	0.0200	0.0211		mg/Kg		105	72 - 120	4	30
Vinyl chloride	0.0200	0.0181		mg/Kg		91	52 - 120	1	30
sec-Butylbenzene	0.0200	0.0212		mg/Kg		106	72 - 120	2	30
t-Butyl alcohol	0.200	0.194		mg/Kg		97	74 - 121	6	30
tert-Butylbenzene	0.0200	0.0199		mg/Kg		99	68 - 120	0	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-69809/6
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Tetrahydrofuran			0.100	0.101		mg/Kg		101	71 - 127	3	30
Xylenes, Total			0.0600	0.0624		mg/Kg		104	75 - 120	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*54 - 135*
4-Bromofluorobenzene (Surr)	*100*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*100*		*52 - 141*

Lab Sample ID: LCSD 410-69809/8
Matrix: Solid
Analysis Batch: 69809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetonitrile			0.150	0.144		mg/Kg		96	61 - 120	12	30
Chlorodifluoromethane			0.0200	0.0229		mg/Kg		115	60 - 133	23	30
Ethyl acetate			0.0200	0.0201		mg/Kg		101	65 - 133	16	30
Ethyl ether			0.0200	0.0240		mg/Kg		120	59 - 135	5	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*54 - 135*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*
Dibromofluoromethane (Surr)	*100*		*50 - 141*
Toluene-d8 (Surr)	*101*		*52 - 141*

Lab Sample ID: MB 410-70130/9
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
1,2,4-Trimethylbenzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,2-Dichloroethane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
1,2,4-Trichlorobenzene	ND		0.50	0.25	mg/Kg			11/24/20 21:22	50
1,4-Dichlorobenzene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
1,4-Dioxane	ND		13	1.9	mg/Kg			11/24/20 21:22	50
4-Methyl-2-pentanone	ND		0.50	0.050	mg/Kg			11/24/20 21:22	50
1,3,5-Trimethylbenzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,3-Dichlorobenzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
2-Hexanone	ND		0.50	0.050	mg/Kg			11/24/20 21:22	50
Acetone	ND		1.0	0.30	mg/Kg			11/24/20 21:22	50
Benzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,1,1-Trichloroethane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
Bromomethane	ND		0.25	0.035	mg/Kg			11/24/20 21:22	50
Carbon tetrachloride	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Chlorobenzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Bromochloromethane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
Chloroethane	ND		0.25	0.050	mg/Kg			11/24/20 21:22	50

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-70130/9
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroform	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
Chloromethane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
Carbon disulfide	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
cis-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Bromoform	ND		0.50	0.25	mg/Kg			11/24/20 21:22	50
cis-1,3-Dichloropropene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
Bromodichloromethane	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
Cyclohexane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,1-Dichloroethane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,1-Dichloroethene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Dibromochloromethane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Dichlorodifluoromethane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
1,2-Dichloropropane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Ethylbenzene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
2-Butanone	ND		0.50	0.10	mg/Kg			11/24/20 21:22	50
Freon 113	ND		0.50	0.030	mg/Kg			11/24/20 21:22	50
1,1,2-Trichloroethane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
2-Nitropropane	ND		0.50	0.10	mg/Kg			11/24/20 21:22	50
m&p-Xylene	ND		0.25	0.050	mg/Kg			11/24/20 21:22	50
Methyl acetate	ND		0.25	0.050	mg/Kg			11/24/20 21:22	50
1,1,2,2-Tetrachloroethane	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
Methyl tertiary butyl ether	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,2,3-Trichlorobenzene	ND		0.50	0.25	mg/Kg			11/24/20 21:22	50
Methylcyclohexane	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
Methylene Chloride	ND		0.25	0.10	mg/Kg			11/24/20 21:22	50
1,2-Dichlorobenzene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
1,2-Dibromo-3-Chloropropane	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Acetonitrile	ND		5.0	1.3	mg/Kg			11/24/20 21:22	50
Isopropylbenzene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
o-Xylene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
Chlorodifluoromethane	ND		0.50	0.10	mg/Kg			11/24/20 21:22	50
Styrene	ND		0.25	0.020	mg/Kg			11/24/20 21:22	50
Cyclohexanone	ND		13	1.3	mg/Kg			11/24/20 21:22	50
Ethyl acetate	ND		0.25	0.050	mg/Kg			11/24/20 21:22	50
Ethyl ether	ND		0.25	0.050	mg/Kg			11/24/20 21:22	50
Tetrachloroethene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Isobutyl alcohol	ND		13	1.9	mg/Kg			11/24/20 21:22	50
Naphthalene	ND		0.25	0.10	mg/Kg			11/24/20 21:22	50
Toluene	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
n-Butanol	ND		13	2.8	mg/Kg			11/24/20 21:22	50
trans-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
n-Butylbenzene	ND		0.40	0.15	mg/Kg			11/24/20 21:22	50
trans-1,3-Dichloropropene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
n-Heptane	ND		0.40	0.15	mg/Kg			11/24/20 21:22	50
Trichloroethene	ND		0.25	0.025	mg/Kg			11/24/20 21:22	50
Trichlorofluoromethane	ND		0.25	0.035	mg/Kg			11/24/20 21:22	50
p-Isopropyltoluene	ND		0.25	0.10	mg/Kg			11/24/20 21:22	50
Vinyl chloride	ND		0.25	0.030	mg/Kg			11/24/20 21:22	50
sec-Butylbenzene	ND		0.25	0.10	mg/Kg			11/24/20 21:22	50

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-70130/9
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
t-Butyl alcohol	ND		5.0	0.75	mg/Kg			11/24/20 21:22	50
tert-Butylbenzene	ND		0.25	0.040	mg/Kg			11/24/20 21:22	50
Tetrahydrofuran	ND		0.40	0.050	mg/Kg			11/24/20 21:22	50
Xylenes, Total	ND		0.50	0.070	mg/Kg			11/24/20 21:22	50

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*					*11/24/20 21:22*	*50*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*54 - 135*		*11/24/20 21:22*	*50*
4-Bromofluorobenzene (Surr)	*89*		*50 - 131*		*11/24/20 21:22*	*50*
Dibromofluoromethane (Surr)	*95*		*50 - 141*		*11/24/20 21:22*	*50*
Toluene-d8 (Surr)	*96*		*52 - 141*		*11/24/20 21:22*	*50*

Lab Sample ID: LCS 410-70130/5
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	1.00	1.06		mg/Kg		106	76 - 120
1,2,4-Trimethylbenzene	1.00	0.943		mg/Kg		94	73 - 120
1,2-Dichloroethane	1.00	0.979		mg/Kg		98	71 - 128
1,2,4-Trichlorobenzene	1.00	0.939		mg/Kg		94	56 - 130
1,4-Dichlorobenzene	1.00	1.00		mg/Kg		100	80 - 120
1,4-Dioxane	25.0	24.1		mg/Kg		96	62 - 131
4-Methyl-2-pentanone	5.00	4.96		mg/Kg		99	67 - 128
1,3,5-Trimethylbenzene	1.00	0.957		mg/Kg		96	73 - 120
1,3-Dichlorobenzene	1.00	0.988		mg/Kg		99	75 - 120
2-Hexanone	5.00	4.24		mg/Kg		85	54 - 140
Acetone	7.50	4.36		mg/Kg		58	41 - 150
Benzene	1.00	0.998		mg/Kg		100	80 - 120
1,1,1-Trichloroethane	1.00	1.09		mg/Kg		109	69 - 123
Bromomethane	1.00	1.10		mg/Kg		110	45 - 140
Carbon tetrachloride	1.00	1.22		mg/Kg		122	64 - 134
Chlorobenzene	1.00	1.01		mg/Kg		101	80 - 120
Bromochloromethane	1.00	0.969		mg/Kg		97	72 - 124
Chloroethane	1.00	0.787		mg/Kg		79	43 - 135
Chloroform	1.00	1.00		mg/Kg		100	80 - 120
Chloromethane	1.00	0.786		mg/Kg		79	56 - 120
Carbon disulfide	1.00	1.01		mg/Kg		101	64 - 133
cis-1,2-Dichloroethene	1.00	1.06		mg/Kg		106	80 - 125
Bromoform	1.00	1.28	*	mg/Kg		128	51 - 127
cis-1,3-Dichloropropene	1.00	1.13		mg/Kg		113	66 - 120
Bromodichloromethane	1.00	1.12		mg/Kg		112	70 - 120
Cyclohexane	1.00	0.942		mg/Kg		94	58 - 126
1,1-Dichloroethane	1.00	0.994		mg/Kg		99	79 - 120
1,1-Dichloroethene	1.00	1.02		mg/Kg		102	73 - 129
Dibromochloromethane	1.00	1.16		mg/Kg		116	69 - 125

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-70130/5
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dichlorodifluoromethane	1.00	0.790		mg/Kg		79	21 - 127
1,2-Dichloropropane	1.00	1.01		mg/Kg		101	80 - 120
Ethylbenzene	1.00	0.979		mg/Kg		98	78 - 120
2-Butanone	7.50	4.94		mg/Kg		66	57 - 128
Freon 113	1.00	0.946		mg/Kg		95	64 - 135
1,1,2-Trichloroethane	1.00	1.04		mg/Kg		104	80 - 120
2-Nitropropane	1.00	2.21	*	mg/Kg		221	27 - 183
m&p-Xylene	2.00	2.00		mg/Kg		100	80 - 120
Methyl acetate	1.00	1.10		mg/Kg		110	67 - 128
1,1,2,2-Tetrachloroethane	1.00	0.970		mg/Kg		97	69 - 125
Methyl tertiary butyl ether	1.00	0.955		mg/Kg		95	72 - 120
1,2,3-Trichlorobenzene	1.00	0.817		mg/Kg		82	57 - 131
Methylcyclohexane	1.00	0.945		mg/Kg		95	61 - 124
Methylene Chloride	1.00	1.01		mg/Kg		101	76 - 122
1,2-Dichlorobenzene	1.00	0.968		mg/Kg		97	76 - 120
1,2-Dibromo-3-Chloropropane	1.00	0.807		mg/Kg		81	48 - 134
Isopropylbenzene	1.00	0.969		mg/Kg		97	77 - 120
o-Xylene	1.00	0.988		mg/Kg		99	75 - 120
Styrene	1.00	1.01		mg/Kg		101	76 - 120
Cyclohexanone	25.0	19.9		mg/Kg		80	47 - 136
Tetrachloroethene	1.00	1.06		mg/Kg		106	73 - 120
Isobutyl alcohol	25.0	26.4		mg/Kg		105	69 - 129
Naphthalene	1.00	0.791		mg/Kg		79	48 - 130
Toluene	1.00	0.995		mg/Kg		100	80 - 120
n-Butanol	50.0	50.4		mg/Kg		101	63 - 123
trans-1,2-Dichloroethene	1.00	1.02		mg/Kg		102	80 - 126
n-Butylbenzene	1.00	0.923		mg/Kg		92	71 - 121
trans-1,3-Dichloropropene	1.00	1.07		mg/Kg		107	68 - 122
n-Heptane	1.00	0.965		mg/Kg		96	50 - 141
Trichloroethene	1.00	1.01		mg/Kg		101	80 - 120
Trichlorofluoromethane	1.00	0.887		mg/Kg		89	55 - 134
p-Isopropyltoluene	1.00	0.968		mg/Kg		97	72 - 120
Vinyl chloride	1.00	0.825		mg/Kg		83	52 - 120
sec-Butylbenzene	1.00	0.951		mg/Kg		95	72 - 120
t-Butyl alcohol	10.0	10.4		mg/Kg		104	74 - 121
tert-Butylbenzene	1.00	0.983		mg/Kg		98	68 - 120
Tetrahydrofuran	5.00	3.75		mg/Kg		75	71 - 127
Xylenes, Total	3.00	2.99		mg/Kg		100	75 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*
4-Bromofluorobenzene (Surr)	*91*		*50 - 131*
Dibromofluoromethane (Surr)	*99*		*50 - 141*
Toluene-d8 (Surr)	*97*		*52 - 141*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-70130/7
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Acetonitrile			7.50	7.04		mg/Kg		94	61 - 120		
Chlorodifluoromethane			1.00	0.808		mg/Kg		81	60 - 133		
Ethyl acetate			1.00	0.938		mg/Kg		94	65 - 133		
Ethyl ether			1.00	1.06		mg/Kg		106	59 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*54 - 135*
4-Bromofluorobenzene (Surr)	*91*		*50 - 131*
Dibromofluoromethane (Surr)	*92*		*50 - 141*
Toluene-d8 (Surr)	*94*		*52 - 141*

Lab Sample ID: LCSD 410-70130/6
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane			1.00	1.06		mg/Kg		106	76 - 120	0	30
1,2,4-Trimethylbenzene			1.00	0.948		mg/Kg		95	73 - 120	1	30
1,2-Dichloroethane			1.00	0.987		mg/Kg		99	71 - 128	1	30
1,2,4-Trichlorobenzene			1.00	0.938		mg/Kg		94	56 - 130	0	30
1,4-Dichlorobenzene			1.00	0.997		mg/Kg		100	80 - 120	1	30
1,4-Dioxane			25.0	25.6		mg/Kg		103	62 - 131	6	30
4-Methyl-2-pentanone			5.00	4.88		mg/Kg		98	67 - 128	2	30
1,3,5-Trimethylbenzene			1.00	0.972		mg/Kg		97	73 - 120	2	30
1,3-Dichlorobenzene			1.00	0.995		mg/Kg		100	75 - 120	1	30
2-Hexanone			5.00	4.51		mg/Kg		90	54 - 140	6	30
Acetone			7.50	5.05		mg/Kg		67	41 - 150	15	30
Benzene			1.00	0.986		mg/Kg		99	80 - 120	1	30
1,1,1-Trichloroethane			1.00	1.08		mg/Kg		108	69 - 123	1	30
Bromomethane			1.00	1.06		mg/Kg		106	45 - 140	3	30
Carbon tetrachloride			1.00	1.21		mg/Kg		121	64 - 134	1	30
Chlorobenzene			1.00	1.01		mg/Kg		101	80 - 120	0	30
Bromochloromethane			1.00	0.973		mg/Kg		97	72 - 124	0	30
Chloroethane			1.00	0.810		mg/Kg		81	43 - 135	3	30
Chloroform			1.00	0.992		mg/Kg		99	80 - 120	1	30
Chloromethane			1.00	0.762		mg/Kg		76	56 - 120	3	30
Carbon disulfide			1.00	0.989		mg/Kg		99	64 - 133	2	30
cis-1,2-Dichloroethene			1.00	1.06		mg/Kg		106	80 - 125	1	30
Bromoform			1.00	1.29	*	mg/Kg		129	51 - 127	0	30
cis-1,3-Dichloropropene			1.00	1.13		mg/Kg		113	66 - 120	0	30
Bromodichloromethane			1.00	1.13		mg/Kg		113	70 - 120	0	30
Cyclohexane			1.00	0.939		mg/Kg		94	58 - 126	0	30
1,1-Dichloroethane			1.00	0.987		mg/Kg		99	79 - 120	1	30
1,1-Dichloroethene			1.00	1.02		mg/Kg		102	73 - 129	0	30
Dibromochloromethane			1.00	1.16		mg/Kg		116	69 - 125	0	30
Dichlorodifluoromethane			1.00	0.794		mg/Kg		79	21 - 127	0	30
1,2-Dichloropropane			1.00	1.01		mg/Kg		101	80 - 120	0	30
Ethylbenzene			1.00	0.983		mg/Kg		98	78 - 120	0	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-70130/6
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2-Butanone	7.50	5.47		mg/Kg		73	57 - 128	10	30
Freon 113	1.00	0.947		mg/Kg		95	64 - 135	0	30
1,1,2-Trichloroethane	1.00	1.05		mg/Kg		105	80 - 120	0	30
2-Nitropropane	1.00	2.39	*	mg/Kg		239	27 - 183	8	30
m&p-Xylene	2.00	2.02		mg/Kg		101	80 - 120	1	30
Methyl acetate	1.00	1.06		mg/Kg		106	67 - 128	4	30
1,1,2,2-Tetrachloroethane	1.00	0.972		mg/Kg		97	69 - 125	0	30
Methyl tertiary butyl ether	1.00	0.950		mg/Kg		95	72 - 120	1	30
1,2,3-Trichlorobenzene	1.00	0.835		mg/Kg		84	57 - 131	2	30
Methylcyclohexane	1.00	0.944		mg/Kg		94	61 - 124	0	30
Methylene Chloride	1.00	0.966		mg/Kg		97	76 - 122	4	30
1,2-Dichlorobenzene	1.00	0.970		mg/Kg		97	76 - 120	0	30
1,2-Dibromo-3-Chloropropane	1.00	0.825		mg/Kg		82	48 - 134	2	30
Isopropylbenzene	1.00	0.976		mg/Kg		98	77 - 120	1	30
o-Xylene	1.00	0.984		mg/Kg		98	75 - 120	0	30
Styrene	1.00	1.01		mg/Kg		101	76 - 120	0	30
Cyclohexanone	25.0	21.7		mg/Kg		87	47 - 136	9	30
Tetrachloroethene	1.00	1.03		mg/Kg		103	73 - 120	3	30
Isobutyl alcohol	25.0	26.1		mg/Kg		104	69 - 129	1	30
Naphthalene	1.00	0.795		mg/Kg		80	48 - 130	1	30
Toluene	1.00	0.993		mg/Kg		99	80 - 120	0	30
n-Butanol	50.0	49.2		mg/Kg		98	63 - 123	3	30
trans-1,2-Dichloroethene	1.00	0.999		mg/Kg		100	80 - 126	2	30
n-Butylbenzene	1.00	0.936		mg/Kg		94	71 - 121	1	30
trans-1,3-Dichloropropene	1.00	1.08		mg/Kg		108	68 - 122	1	30
n-Heptane	1.00	0.963		mg/Kg		96	50 - 141	0	30
Trichloroethene	1.00	0.997		mg/Kg		100	80 - 120	1	30
Trichlorofluoromethane	1.00	0.877		mg/Kg		88	55 - 134	1	30
p-Isopropyltoluene	1.00	0.978		mg/Kg		98	72 - 120	1	30
Vinyl chloride	1.00	0.820		mg/Kg		82	52 - 120	1	30
sec-Butylbenzene	1.00	0.978		mg/Kg		98	72 - 120	3	30
t-Butyl alcohol	10.0	10.0		mg/Kg		100	74 - 121	4	30
tert-Butylbenzene	1.00	1.02		mg/Kg		102	68 - 120	4	30
Tetrahydrofuran	5.00	4.05		mg/Kg		81	71 - 127	8	30
Xylenes, Total	3.00	3.00		mg/Kg		100	75 - 120	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*
4-Bromofluorobenzene (Surr)	*90*		*50 - 131*
Dibromofluoromethane (Surr)	*98*		*50 - 141*
Toluene-d8 (Surr)	*97*		*52 - 141*

Lab Sample ID: LCSD 410-70130/8
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetonitrile	7.50	7.72		mg/Kg		103	61 - 120	9	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-70130/8
Matrix: Solid
Analysis Batch: 70130

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chlorodifluoromethane			1.00	0.911		mg/Kg		91	60 - 133	12	30
Ethyl acetate			1.00	0.955		mg/Kg		95	65 - 133	2	30
Ethyl ether			1.00	1.05		mg/Kg		105	59 - 135	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*54 - 135*
4-Bromofluorobenzene (Surr)	*92*		*50 - 131*
Dibromofluoromethane (Surr)	*94*		*50 - 141*
Toluene-d8 (Surr)	*96*		*52 - 141*

Lab Sample ID: MB 410-71355/9
Matrix: Water
Analysis Batch: 71355

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
1,2,4-Trimethylbenzene	ND		5.0	1.0	ug/L			12/01/20 11:31	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 11:31	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 11:31	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 11:31	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 11:31	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 11:31	1
1,3,5-Trimethylbenzene	ND		5.0	0.30	ug/L			12/01/20 11:31	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 11:31	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 11:31	1
Acetone	ND		20	0.70	ug/L			12/01/20 11:31	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 11:31	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 11:31	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 11:31	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 11:31	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 11:31	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 11:31	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Cyclohexane	ND		5.0	1.0	ug/L			12/01/20 11:31	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/01/20 11:31	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 11:31	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-71355/9
Matrix: Water
Analysis Batch: 71355

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Freon 113	ND		10	0.20	ug/L			12/01/20 11:31	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 11:31	1
m&p-Xylene	ND		5.0	1.0	ug/L			12/01/20 11:31	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 11:31	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 11:31	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 11:31	1
Methylcyclohexane	ND		5.0	0.50	ug/L			12/01/20 11:31	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 11:31	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 11:31	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 11:31	1
Acetonitrile	ND		100	16	ug/L			12/01/20 11:31	1
Isopropylbenzene	ND		5.0	0.20	ug/L			12/01/20 11:31	1
o-Xylene	ND		1.0	0.40	ug/L			12/01/20 11:31	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 11:31	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 11:31	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 11:31	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 11:31	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 11:31	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 11:31	1
Naphthalene	ND		5.0	1.0	ug/L			12/01/20 11:31	1
Toluene	ND		1.0	0.20	ug/L			12/01/20 11:31	1
n-Butanol	ND		250	61	ug/L			12/01/20 11:31	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 11:31	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 11:31	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 11:31	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 11:31	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 11:31	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 11:31	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 11:31	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 11:31	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 11:31	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 11:31	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 11:31	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 11:31	1
Xylenes, Total	ND		6.0	1.4	ug/L			12/01/20 11:31	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 11:31*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*12/01/20 11:31*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*12/01/20 11:31*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 120*		*12/01/20 11:31*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 11:31*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-71355/6
Matrix: Water
Analysis Batch: 71355

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	20.0	20.4		ug/L		102	77 - 120
1,2,4-Trimethylbenzene	20.0	20.3		ug/L		101	75 - 120
1,2-Dichloroethane	20.0	20.7		ug/L		103	73 - 124
1,2,4-Trichlorobenzene	20.0	18.6		ug/L		93	63 - 120
1,4-Dichlorobenzene	20.0	19.9		ug/L		100	80 - 120
1,4-Dioxane	500	550		ug/L		110	63 - 146
4-Methyl-2-pentanone	100	115		ug/L		115	62 - 133
1,3,5-Trimethylbenzene	20.0	20.3		ug/L		102	75 - 120
1,3-Dichlorobenzene	20.0	19.6		ug/L		98	80 - 120
2-Hexanone	100	122		ug/L		122	56 - 135
Acetone	150	170		ug/L		113	54 - 157
Benzene	20.0	20.4		ug/L		102	80 - 120
1,1,1-Trichloroethane	20.0	18.6		ug/L		93	67 - 126
Bromomethane	20.0	19.7		ug/L		99	53 - 128
Carbon tetrachloride	20.0	18.0		ug/L		90	64 - 134
Chlorobenzene	20.0	20.5		ug/L		103	80 - 120
Bromochloromethane	20.0	19.0		ug/L		95	80 - 120
Chloroethane	20.0	20.8		ug/L		104	55 - 123
Chloroform	20.0	20.2		ug/L		101	80 - 120
Chloromethane	20.0	21.1		ug/L		105	56 - 121
Carbon disulfide	20.0	18.1		ug/L		91	65 - 128
cis-1,2-Dichloroethene	20.0	20.7		ug/L		103	80 - 125
Bromoform	20.0	19.0		ug/L		95	51 - 120
cis-1,3-Dichloropropene	20.0	19.8		ug/L		99	75 - 120
Bromodichloromethane	20.0	19.9		ug/L		99	71 - 120
Cyclohexane	20.0	19.2		ug/L		96	68 - 126
1,1-Dichloroethane	20.0	20.2		ug/L		101	80 - 120
1,1-Dichloroethene	20.0	18.7		ug/L		94	80 - 131
Dibromochloromethane	20.0	20.5		ug/L		102	71 - 120
Dichlorodifluoromethane	20.0	16.6		ug/L		83	41 - 127
1,2-Dichloropropane	20.0	21.1		ug/L		105	80 - 120
Ethylbenzene	20.0	20.6		ug/L		103	80 - 120
2-Butanone	150	168		ug/L		112	59 - 135
Freon 113	20.0	17.3		ug/L		87	73 - 139
1,1,2-Trichloroethane	20.0	21.8		ug/L		109	80 - 120
2-Nitropropane	20.0	18.9		ug/L		95	19 - 144
m&p-Xylene	40.0	40.9		ug/L		102	80 - 120
Methyl acetate	20.0	21.1		ug/L		106	54 - 136
1,1,2,2-Tetrachloroethane	20.0	21.6		ug/L		108	72 - 120
Methyl tertiary butyl ether	20.0	19.1		ug/L		95	69 - 122
1,2,3-Trichlorobenzene	20.0	18.8		ug/L		94	66 - 120
Methylcyclohexane	20.0	18.5		ug/L		93	67 - 121
Methylene Chloride	20.0	20.7		ug/L		104	80 - 120
1,2-Dichlorobenzene	20.0	20.0		ug/L		100	80 - 120
1,2-Dibromo-3-Chloropropane	20.0	19.4		ug/L		97	47 - 131
Isopropylbenzene	20.0	20.5		ug/L		102	80 - 120
o-Xylene	20.0	20.0		ug/L		100	80 - 120
Styrene	20.0	19.9		ug/L		99	80 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-71355/6
Matrix: Water
Analysis Batch: 71355

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyclohexanone	500	422		ug/L		84	27 - 141
Ethyl ether	20.0	21.4		ug/L		107	59 - 141
Tetrachloroethene	20.0	18.5		ug/L		93	80 - 120
Isobutyl alcohol	500	544		ug/L		109	61 - 136
Naphthalene	20.0	19.5		ug/L		97	53 - 124
Toluene	20.0	20.9		ug/L		104	80 - 120
n-Butanol	1000	1090		ug/L		109	57 - 130
trans-1,2-Dichloroethene	20.0	19.1		ug/L		95	80 - 126
n-Butylbenzene	20.0	19.8		ug/L		99	76 - 120
trans-1,3-Dichloropropene	20.0	20.1		ug/L		100	67 - 120
n-Heptane	20.0	18.1		ug/L		90	56 - 133
Trichloroethene	20.0	19.3		ug/L		97	80 - 120
Trichlorofluoromethane	20.0	17.2		ug/L		86	55 - 135
p-Isopropyltoluene	20.0	20.0		ug/L		100	76 - 120
Vinyl chloride	20.0	20.5		ug/L		103	56 - 120
sec-Butylbenzene	20.0	20.2		ug/L		101	77 - 120
t-Butyl alcohol	200	191		ug/L		96	60 - 130
tert-Butylbenzene	20.0	18.8		ug/L		94	78 - 120
Tetrahydrofuran	100	112		ug/L		112	54 - 144
Xylenes, Total	60.0	60.9		ug/L		102	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*
Dibromofluoromethane (Surr)	*98*		*80 - 120*
Toluene-d8 (Surr)	*105*		*80 - 120*

Lab Sample ID: LCS 410-71355/7
Matrix: Water
Analysis Batch: 71355

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetonitrile	150	182		ug/L		121	66 - 149
Chlorodifluoromethane	20.0	20.7		ug/L		104	45 - 149
Ethyl acetate	20.0	22.7		ug/L		113	67 - 131

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*
Dibromofluoromethane (Surr)	*96*		*80 - 120*
Toluene-d8 (Surr)	*104*		*80 - 120*

Lab Sample ID: MB 410-71948/12
Matrix: Water
Analysis Batch: 71948

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/02/20 15:03	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-71948/12
Matrix: Water
Analysis Batch: 71948

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	ND		5.0	1.0	ug/L			12/02/20 15:03	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/02/20 15:03	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/02/20 15:03	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/02/20 15:03	1
1,4-Dioxane	ND		250	29	ug/L			12/02/20 15:03	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/02/20 15:03	1
1,3,5-Trimethylbenzene	ND		5.0	0.30	ug/L			12/02/20 15:03	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/02/20 15:03	1
2-Hexanone	ND		10	0.30	ug/L			12/02/20 15:03	1
Acetone	ND		20	0.70	ug/L			12/02/20 15:03	1
Benzene	ND		1.0	0.20	ug/L			12/02/20 15:03	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/02/20 15:03	1
Bromomethane	ND		1.0	0.30	ug/L			12/02/20 15:03	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/02/20 15:03	1
Chloroethane	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Chloroform	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Chloromethane	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/02/20 15:03	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Bromoform	ND		4.0	1.0	ug/L			12/02/20 15:03	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Cyclohexane	ND		5.0	1.0	ug/L			12/02/20 15:03	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/02/20 15:03	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/02/20 15:03	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/02/20 15:03	1
2-Butanone	ND		10	0.30	ug/L			12/02/20 15:03	1
Freon 113	ND		10	0.20	ug/L			12/02/20 15:03	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/02/20 15:03	1
2-Nitropropane	ND		10	0.80	ug/L			12/02/20 15:03	1
m&p-Xylene	ND		5.0	1.0	ug/L			12/02/20 15:03	1
Methyl acetate	ND		5.0	0.30	ug/L			12/02/20 15:03	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/02/20 15:03	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/02/20 15:03	1
Methylcyclohexane	ND		5.0	0.50	ug/L			12/02/20 15:03	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/02/20 15:03	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/02/20 15:03	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/02/20 15:03	1
Acetonitrile	ND		100	16	ug/L			12/02/20 15:03	1
Isopropylbenzene	ND		5.0	0.20	ug/L			12/02/20 15:03	1
o-Xylene	ND		1.0	0.40	ug/L			12/02/20 15:03	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/02/20 15:03	1
Styrene	ND		5.0	0.20	ug/L			12/02/20 15:03	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-71948/12
Matrix: Water
Analysis Batch: 71948

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyclohexanone	ND		100	25	ug/L			12/02/20 15:03	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/02/20 15:03	1
Ethyl ether	ND		5.0	0.20	ug/L			12/02/20 15:03	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Isobutyl alcohol	ND		250	36	ug/L			12/02/20 15:03	1
Naphthalene	ND		5.0	1.0	ug/L			12/02/20 15:03	1
Toluene	ND		1.0	0.20	ug/L			12/02/20 15:03	1
n-Butanol	ND		250	61	ug/L			12/02/20 15:03	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/02/20 15:03	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/02/20 15:03	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/02/20 15:03	1
n-Heptane	ND		5.0	2.0	ug/L			12/02/20 15:03	1
Trichloroethene	ND		1.0	0.20	ug/L			12/02/20 15:03	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/02/20 15:03	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/02/20 15:03	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/02/20 15:03	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/02/20 15:03	1
t-Butyl alcohol	ND		50	12	ug/L			12/02/20 15:03	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/02/20 15:03	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/02/20 15:03	1
Xylenes, Total	ND		6.0	1.4	ug/L			12/02/20 15:03	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/02/20 15:03*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*12/02/20 15:03*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*12/02/20 15:03*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 120*		*12/02/20 15:03*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*12/02/20 15:03*	*1*

Lab Sample ID: LCS 410-71948/8
Matrix: Water
Analysis Batch: 71948

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	20.0	19.6		ug/L		98	77 - 120
1,2,4-Trimethylbenzene	20.0	19.5		ug/L		98	75 - 120
1,2-Dichloroethane	20.0	20.0		ug/L		100	73 - 124
1,2,4-Trichlorobenzene	20.0	17.9		ug/L		89	63 - 120
1,4-Dichlorobenzene	20.0	19.4		ug/L		97	80 - 120
1,4-Dioxane	500	517		ug/L		103	63 - 146
4-Methyl-2-pentanone	100	113		ug/L		113	62 - 133
1,3,5-Trimethylbenzene	20.0	19.8		ug/L		99	75 - 120
1,3-Dichlorobenzene	20.0	19.3		ug/L		96	80 - 120
2-Hexanone	100	126		ug/L		126	56 - 135
Acetone	150	231		ug/L		154	54 - 157
Benzene	20.0	20.1		ug/L		100	80 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-71948/8
Matrix: Water
Analysis Batch: 71948

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	18.8		ug/L		94	67 - 126
Bromomethane	20.0	17.8		ug/L		89	53 - 128
Carbon tetrachloride	20.0	18.1		ug/L		90	64 - 134
Chlorobenzene	20.0	20.1		ug/L		101	80 - 120
Bromochloromethane	20.0	19.1		ug/L		95	80 - 120
Chloroethane	20.0	19.4		ug/L		97	55 - 123
Chloroform	20.0	19.9		ug/L		99	80 - 120
Chloromethane	20.0	18.5		ug/L		92	56 - 121
Carbon disulfide	20.0	18.4		ug/L		92	65 - 128
cis-1,2-Dichloroethene	20.0	20.2		ug/L		101	80 - 125
Bromoform	20.0	17.4		ug/L		87	51 - 120
cis-1,3-Dichloropropene	20.0	19.1		ug/L		96	75 - 120
Bromodichloromethane	20.0	19.0		ug/L		95	71 - 120
Cyclohexane	20.0	19.3		ug/L		97	68 - 126
1,1-Dichloroethane	20.0	20.5		ug/L		103	80 - 120
1,1-Dichloroethene	20.0	18.5		ug/L		93	80 - 131
Dibromochloromethane	20.0	19.4		ug/L		97	71 - 120
Dichlorodifluoromethane	20.0	14.5		ug/L		72	41 - 127
1,2-Dichloropropane	20.0	20.9		ug/L		105	80 - 120
Ethylbenzene	20.0	20.0		ug/L		100	80 - 120
2-Butanone	150	191		ug/L		127	59 - 135
Freon 113	20.0	17.4		ug/L		87	73 - 139
1,1,2-Trichloroethane	20.0	20.9		ug/L		105	80 - 120
2-Nitropropane	20.0	19.6		ug/L		98	19 - 144
m&p-Xylene	40.0	39.9		ug/L		100	80 - 120
Methyl acetate	20.0	22.4		ug/L		112	54 - 136
1,1,2,2-Tetrachloroethane	20.0	20.9		ug/L		105	72 - 120
Methyl tertiary butyl ether	20.0	18.4		ug/L		92	69 - 122
1,2,3-Trichlorobenzene	20.0	18.1		ug/L		90	66 - 120
Methylcyclohexane	20.0	19.1		ug/L		96	67 - 121
Methylene Chloride	20.0	20.3		ug/L		101	80 - 120
1,2-Dichlorobenzene	20.0	19.3		ug/L		97	80 - 120
1,2-Dibromo-3-Chloropropane	20.0	18.5		ug/L		92	47 - 131
Isopropylbenzene	20.0	19.6		ug/L		98	80 - 120
o-Xylene	20.0	19.3		ug/L		97	80 - 120
Styrene	20.0	19.2		ug/L		96	80 - 120
Cyclohexanone	500	484		ug/L		97	27 - 141
Ethyl ether	20.0	21.8		ug/L		109	59 - 141
Tetrachloroethene	20.0	18.7		ug/L		93	80 - 120
Isobutyl alcohol	500	532		ug/L		106	61 - 136
Naphthalene	20.0	18.4		ug/L		92	53 - 124
Toluene	20.0	20.7		ug/L		103	80 - 120
n-Butanol	1000	1150		ug/L		115	57 - 130
trans-1,2-Dichloroethene	20.0	18.9		ug/L		94	80 - 126
n-Butylbenzene	20.0	19.5		ug/L		97	76 - 120
trans-1,3-Dichloropropene	20.0	19.4		ug/L		97	67 - 120
n-Heptane	20.0	17.7		ug/L		88	56 - 133
Trichloroethene	20.0	19.2		ug/L		96	80 - 120
Trichlorofluoromethane	20.0	16.1		ug/L		81	55 - 135

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-71948/8
Matrix: Water
Analysis Batch: 71948

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
p-Isopropyltoluene	20.0	19.4		ug/L		97	76 - 120
Vinyl chloride	20.0	19.2		ug/L		96	56 - 120
sec-Butylbenzene	20.0	19.8		ug/L		99	77 - 120
t-Butyl alcohol	200	180		ug/L		90	60 - 130
tert-Butylbenzene	20.0	18.4		ug/L		92	78 - 120
Tetrahydrofuran	100	121		ug/L		121	54 - 144
Xylenes, Total	60.0	59.2		ug/L		99	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 120*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*
Dibromofluoromethane (Surr)	*98*		*80 - 120*
Toluene-d8 (Surr)	*106*		*80 - 120*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 410-68893/1-A
Matrix: Solid
Analysis Batch: 70185

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 68893

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.037	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
1,2,4,5-Tetrachlorobenzene	ND		0.037	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2,2'-oxybis[1-chloropropane]	ND		0.043	0.020	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2,3,4,6-Tetrachlorophenol	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2,4,5-Trichlorophenol	ND		0.067	0.030	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2,4,6-Trichlorophenol	ND		0.057	0.027	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2,4-Dichlorophenol	ND		0.043	0.020	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2,4-Dimethylphenol	ND		0.067	0.030	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2,4-Dinitrophenol	ND		1.0	0.33	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2,4-Dinitrotoluene	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2,6-Dinitrotoluene	ND		0.050	0.023	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2-Chloronaphthalene	ND		0.033	0.0067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2-Chlorophenol	ND		0.037	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2-Methylnaphthalene	ND		0.033	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2-Methylphenol	ND		0.067	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2-Nitroaniline	ND		0.050	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
2-Nitrophenol	ND		0.057	0.027	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
3,3'-Dichlorobenzidine	ND		0.33	0.10	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
3-Nitroaniline	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
4,6-Dinitro-2-methylphenol	ND		0.50	0.23	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
4-Bromophenyl-phenylether	ND		0.050	0.023	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
4-Chloro-3-methylphenol	ND		0.050	0.023	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
3,4-Methylphenol	ND		0.050	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
4-Nitroaniline	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
4-Nitrophenol	ND		0.50	0.17	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Acenaphthene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Acenaphthylene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Acetophenone	ND		0.050	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-68893/1-A
Matrix: Solid
Analysis Batch: 70185

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 68893

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anthracene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Atrazine	ND		0.43	0.20	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Benzaldehyde	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Benzo[a]anthracene	ND		0.017	0.0067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Benzo[a]pyrene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Benzo[b]fluoranthene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Benzo[g,h,i]perylene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Benzo[k]fluoranthene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Butylbenzylphthalate	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Caprolactam	ND		0.17	0.033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Carbazole	ND		0.037	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Chrysene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Di-n-butyl phthalate	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Di-n-octyl phthalate	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Dibenz(a,h)anthracene	ND		0.017	0.0067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Dibenzofuran	ND		0.037	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Diethyl phthalate	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
4-Chloroaniline	ND		0.17	0.033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Dimethyl phthalate	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Fluoranthene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
4-Chlorophenyl-phenyl ether	ND		0.043	0.020	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Fluorene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Hexachlorobenzene	ND		0.017	0.0067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Hexachlorobutadiene	ND		0.077	0.037	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Hexachlorocyclopentadiene	ND		0.50	0.20	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Hexachloroethane	ND		0.17	0.033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Indeno[1,2,3-cd]pyrene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Isophorone	ND		0.037	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
N-Nitrosodi-n-propylamine	ND		0.050	0.023	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
N-Nitrosodiphenylamine	ND		0.037	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Naphthalene	ND		0.017	0.0067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Nitrobenzene	ND		0.067	0.027	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Aniline	ND		0.50	0.17	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Phenanthrene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Phenol	ND		0.037	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Pentachlorophenol	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Pyrene	ND		0.017	0.0033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Bis(2-chloroethoxy)methane	ND		0.037	0.017	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Bis(2-chloroethyl)ether	ND		0.050	0.023	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Bis(2-ethylhexyl) phthalate	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Benzyl alcohol	ND		0.50	0.17	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Dicyclohexylamine	ND		2.0	0.67	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
n,n'-Dimethylaniline	ND		0.17	0.033	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Pyridine	ND		0.17	0.067	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
Triethylamine	ND		5.0	1.7	mg/Kg		11/21/20 07:13	11/25/20 14:37	1
1,4-Dioxane	ND		0.33	0.10	mg/Kg		11/21/20 07:13	11/25/20 14:37	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-68893/1-A
Matrix: Solid
Analysis Batch: 70185

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 68893

Tentatively Identified Compound	MB Est. Result	MB Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	49.2	T J	mg/Kg		1.77		11/21/20 07:13	11/25/20 14:37	1
Furan, 2,5-dimethyl-	0.195	T J N	mg/Kg		2.26	625-86-5	11/21/20 07:13	11/25/20 14:37	1
Unknown	0.609	T J	mg/Kg		3.89		11/21/20 07:13	11/25/20 14:37	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	95		13 - 121	11/21/20 07:13	11/25/20 14:37	1
2-Fluorobiphenyl (Surr)	90		39 - 100	11/21/20 07:13	11/25/20 14:37	1
2-Fluorophenol (Surr)	84		26 - 96	11/21/20 07:13	11/25/20 14:37	1
Nitrobenzene-d5 (Surr)	73		32 - 97	11/21/20 07:13	11/25/20 14:37	1
p-Terphenyl-d14 (Surr)	107		45 - 108	11/21/20 07:13	11/25/20 14:37	1
Phenol-d5 (Surr)	86		27 - 104	11/21/20 07:13	11/25/20 14:37	1

Lab Sample ID: LCS 410-68893/2-A
Matrix: Solid
Analysis Batch: 70185

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 68893

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	1.67	1.23		mg/Kg		74	59 - 106
1,2,4,5-Tetrachlorobenzene	1.67	1.20		mg/Kg		72	60 - 102
2,2'-oxybis[1-chloropropane]	1.67	1.04		mg/Kg		62	44 - 105
2,3,4,6-Tetrachlorophenol	1.67	1.42		mg/Kg		85	66 - 116
2,4,5-Trichlorophenol	1.67	1.40		mg/Kg		84	67 - 110
2,4,6-Trichlorophenol	1.67	1.41		mg/Kg		85	60 - 120
2,4-Dichlorophenol	1.67	1.26		mg/Kg		75	64 - 109
2,4-Dimethylphenol	1.67	1.26		mg/Kg		76	46 - 88
2,4-Dinitrophenol	3.33	2.73		mg/Kg		82	47 - 126
2,4-Dinitrotoluene	1.67	1.38		mg/Kg		83	67 - 115
2,6-Dinitrotoluene	1.67	1.42		mg/Kg		85	67 - 113
2-Chloronaphthalene	1.67	1.28		mg/Kg		77	56 - 112
2-Chlorophenol	1.67	1.14		mg/Kg		69	59 - 97
2-Methylnaphthalene	1.67	1.24		mg/Kg		75	63 - 101
2-Methylphenol	1.67	1.27		mg/Kg		76	56 - 105
2-Nitroaniline	1.67	1.27		mg/Kg		76	63 - 119
2-Nitrophenol	1.67	1.17		mg/Kg		70	55 - 104
3,3'-Dichlorobenzidine	3.33	2.21		mg/Kg		66	40 - 107
3-Nitroaniline	1.67	1.23		mg/Kg		74	59 - 124
4,6-Dinitro-2-methylphenol	3.33	2.63		mg/Kg		79	63 - 126
4-Bromophenyl-phenylether	1.67	1.33		mg/Kg		80	68 - 114
4-Chloro-3-methylphenol	1.67	1.32		mg/Kg		79	62 - 117
3,4-Methylphenol	1.67	1.13		mg/Kg		68	56 - 100
4-Nitroaniline	1.67	1.45		mg/Kg		87	45 - 99
4-Nitrophenol	3.33	2.69		mg/Kg		81	52 - 114
Acenaphthene	1.67	1.28		mg/Kg		77	61 - 104
Acenaphthylene	1.67	1.57		mg/Kg		94	59 - 116
Acetophenone	1.67	1.04		mg/Kg		62	54 - 95
Anthracene	1.67	1.46		mg/Kg		87	75 - 114
Atrazine	1.68	1.60		mg/Kg		95	76 - 120
Benzaldehyde	1.68	0.931		mg/Kg		55	18 - 88

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-68893/2-A
Matrix: Solid
Analysis Batch: 70185

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 68893

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzo[a]anthracene	1.67	1.46		mg/Kg		88	73 - 114
Benzo[a]pyrene	1.67	1.36		mg/Kg		81	76 - 113
Benzo[b]fluoranthene	1.67	1.42		mg/Kg		85	73 - 117
Benzo[g,h,i]perylene	1.67	1.48		mg/Kg		89	77 - 114
Benzo[k]fluoranthene	1.67	1.40		mg/Kg		84	66 - 122
Butylbenzylphthalate	1.67	1.32		mg/Kg		79	62 - 123
Caprolactam	1.68	1.27		mg/Kg		75	66 - 109
Carbazole	1.67	1.48		mg/Kg		89	74 - 117
Chrysene	1.67	1.41		mg/Kg		84	66 - 111
Di-n-butyl phthalate	1.67	1.44		mg/Kg		86	70 - 126
Di-n-octyl phthalate	1.67	1.46		mg/Kg		87	60 - 133
Dibenz(a,h)anthracene	1.67	1.49		mg/Kg		90	81 - 121
Dibenzofuran	1.67	1.36		mg/Kg		82	62 - 113
Diethyl phthalate	1.67	1.35		mg/Kg		81	68 - 116
4-Chloroaniline	1.67	0.927		mg/Kg		56	38 - 90
Dimethyl phthalate	1.67	1.32		mg/Kg		79	66 - 113
Fluoranthene	1.67	1.44		mg/Kg		87	65 - 114
4-Chlorophenyl-phenyl ether	1.67	1.30		mg/Kg		78	58 - 110
Fluorene	1.67	1.31		mg/Kg		79	62 - 110
Hexachlorobenzene	1.67	1.33		mg/Kg		80	69 - 116
Hexachlorobutadiene	1.67	1.06		mg/Kg		63	49 - 106
Hexachlorocyclopentadiene	1.67	1.18		mg/Kg		71	19 - 100
Hexachloroethane	1.67	0.965		mg/Kg		58	48 - 86
Indeno[1,2,3-cd]pyrene	1.67	1.52		mg/Kg		91	71 - 122
Isophorone	1.67	1.22		mg/Kg		73	52 - 103
N-Nitrosodi-n-propylamine	1.67	1.11		mg/Kg		67	51 - 100
N-Nitrosodiphenylamine	1.42	1.21		mg/Kg		85	74 - 115
Naphthalene	1.67	1.12		mg/Kg		67	60 - 94
Nitrobenzene	1.67	1.06		mg/Kg		64	50 - 99
Aniline	1.67	0.995		mg/Kg		60	37 - 77
Phenanthrene	1.67	1.38		mg/Kg		83	74 - 112
Phenol	1.67	1.20		mg/Kg		72	54 - 100
Pentachlorophenol	3.33	2.97		mg/Kg		89	51 - 121
Pyrene	1.67	1.34		mg/Kg		80	70 - 103
Bis(2-chloroethoxy)methane	1.67	1.09		mg/Kg		65	53 - 101
Bis(2-chloroethyl)ether	1.67	1.01		mg/Kg		61	49 - 94
Bis(2-ethylhexyl) phthalate	1.67	1.39		mg/Kg		83	62 - 123
Benzyl alcohol	1.67	1.24		mg/Kg		74	44 - 109
Pyridine	3.33	1.31		mg/Kg		39	30 - 62
1,4-Dioxane	1.67	0.599		mg/Kg		36	20 - 53

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*89*		*13 - 121*
2-Fluorobiphenyl (Surr)	*77*		*39 - 100*
2-Fluorophenol (Surr)	*68*		*26 - 96*
Nitrobenzene-d5 (Surr)	*62*		*32 - 97*
p-Terphenyl-d14 (Surr)	*93*		*45 - 108*
Phenol-d5 (Surr)	*74*		*27 - 104*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-68893/7-A
Matrix: Solid
Analysis Batch: 70185

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 68893

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dicyclohexylamine			1.67	0.919	J	mg/Kg		55	49 - 141		
n,n'-Dimethylaniline			0.842	0.575		mg/Kg		68	32 - 133		
Triethylamine			1.67	ND	*-	mg/Kg		15	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*94*		*13 - 121*
2-Fluorobiphenyl (Surr)	*86*		*39 - 100*
2-Fluorophenol (Surr)	*79*		*26 - 96*
Nitrobenzene-d5 (Surr)	*67*		*32 - 97*
p-Terphenyl-d14 (Surr)	*100*		*45 - 108*
Phenol-d5 (Surr)	*82*		*27 - 104*

Lab Sample ID: LCSD 410-68893/8-A
Matrix: Solid
Analysis Batch: 70185

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 68893

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dicyclohexylamine			1.67	1.11	J	mg/Kg		66	49 - 141	19	30
n,n'-Dimethylaniline			0.842	0.661		mg/Kg		79	32 - 133	14	30
Triethylamine			1.67	ND	*- *1	mg/Kg		37	70 - 130	82	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*99*		*13 - 121*
2-Fluorobiphenyl (Surr)	*90*		*39 - 100*
2-Fluorophenol (Surr)	*83*		*26 - 96*
Nitrobenzene-d5 (Surr)	*72*		*32 - 97*
p-Terphenyl-d14 (Surr)	*109*	*S1+*	*45 - 108*
Phenol-d5 (Surr)	*85*		*27 - 104*

Lab Sample ID: 410-21427-9 MS
Matrix: Soil
Analysis Batch: 70185

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68893

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1'-Biphenyl	ND		2.03	1.38		mg/Kg	☼	68	59 - 106		
1,2,4,5-Tetrachlorobenzene	ND		2.03	1.24		mg/Kg	☼	61	60 - 102		
2,2'-oxybis[1-chloropropane]	ND		2.03	1.20		mg/Kg	☼	59	44 - 105		
2,3,4,6-Tetrachlorophenol	ND		2.03	1.37		mg/Kg	☼	68	66 - 116		
2,4,5-Trichlorophenol	ND		2.03	1.39		mg/Kg	☼	69	67 - 110		
2,4,6-Trichlorophenol	ND		2.03	1.40		mg/Kg	☼	69	60 - 120		
2,4-Dichlorophenol	ND		2.03	1.39		mg/Kg	☼	69	64 - 109		
2,4-Dimethylphenol	ND	F1	2.03	1.52		mg/Kg	☼	75	46 - 88		
2,4-Dinitrophenol	ND	F1 F2	4.05	0.931	J F1	mg/Kg	☼	23	47 - 126		
2,4-Dinitrotoluene	ND		2.03	1.63		mg/Kg	☼	80	67 - 115		
2,6-Dinitrotoluene	ND		2.03	1.66		mg/Kg	☼	82	67 - 113		
2-Chloronaphthalene	ND		2.03	1.42		mg/Kg	☼	70	56 - 112		
2-Chlorophenol	ND		2.03	1.35		mg/Kg	☼	67	59 - 97		
2-Methylnaphthalene	0.0042	J	2.03	1.46		mg/Kg	☼	72	63 - 101		

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-21427-9 MS
Matrix: Soil
Analysis Batch: 70185

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68893

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Methylphenol	ND		2.03	1.54		mg/Kg	☼	76	56 - 105
2-Nitroaniline	ND		2.03	1.56		mg/Kg	☼	77	63 - 119
2-Nitrophenol	ND	F1 F2	2.03	0.548	F1	mg/Kg	☼	27	55 - 104
3,3'-Dichlorobenzidine	ND	F1 F2	4.05	1.15	F1	mg/Kg	☼	28	40 - 107
3-Nitroaniline	ND		2.03	1.78		mg/Kg	☼	88	59 - 124
4,6-Dinitro-2-methylphenol	ND	F1 F2	4.05	2.25	F1	mg/Kg	☼	55	63 - 126
4-Bromophenyl-phenylether	ND		2.03	1.67		mg/Kg	☼	83	68 - 114
4-Chloro-3-methylphenol	ND		2.03	1.65		mg/Kg	☼	81	62 - 117
3,4-Methylphenol	ND		2.03	1.41		mg/Kg	☼	69	56 - 100
4-Nitroaniline	ND		2.03	1.67		mg/Kg	☼	82	45 - 99
4-Nitrophenol	ND		4.05	3.05		mg/Kg	☼	75	52 - 114
Acenaphthene	ND		2.03	1.50		mg/Kg	☼	74	61 - 104
Acenaphthylene	ND		2.03	1.91		mg/Kg	☼	94	59 - 116
Acetophenone	ND		2.03	1.19		mg/Kg	☼	59	54 - 95
Anthracene	ND		2.03	1.86		mg/Kg	☼	92	75 - 114
Atrazine	ND		2.04	1.84		mg/Kg	☼	90	76 - 120
Benzaldehyde	ND		2.05	1.17		mg/Kg	☼	57	18 - 88
Benzo[a]anthracene	ND		2.03	1.78		mg/Kg	☼	88	73 - 114
Benzo[a]pyrene	ND		2.03	1.72		mg/Kg	☼	85	76 - 113
Benzo[b]fluoranthene	ND		2.03	1.72		mg/Kg	☼	85	73 - 117
Benzo[g,h,i]perylene	ND		2.03	1.77		mg/Kg	☼	87	77 - 114
Benzo[k]fluoranthene	ND		2.03	1.77		mg/Kg	☼	88	66 - 122
Bis(2-chloroethoxy)methane	ND		2.03	1.20		mg/Kg	☼	59	53 - 101
Bis(2-chloroethyl)ether	ND		2.03	1.15		mg/Kg	☼	57	49 - 94
Bis(2-ethylhexyl) phthalate	ND		2.03	1.78		mg/Kg	☼	88	62 - 123
Butylbenzylphthalate	ND		2.03	1.74		mg/Kg	☼	86	62 - 123
Caprolactam	ND	F1	2.05	1.31	F1	mg/Kg	☼	64	66 - 109
Carbazole	ND		2.03	1.85		mg/Kg	☼	91	74 - 117
Chrysene	ND		2.03	1.77		mg/Kg	☼	87	66 - 111
Di-n-butyl phthalate	ND		2.03	1.80		mg/Kg	☼	89	70 - 126
Di-n-octyl phthalate	ND		2.03	1.84		mg/Kg	☼	91	60 - 133
Dibenz(a,h)anthracene	ND		2.03	1.82		mg/Kg	☼	90	81 - 121
Dibenzofuran	ND		2.03	1.58		mg/Kg	☼	78	62 - 113
Diethyl phthalate	ND		2.03	1.62		mg/Kg	☼	80	68 - 116
Dimethyl phthalate	ND		2.03	1.71		mg/Kg	☼	85	66 - 113
Fluoranthene	0.0089	J	2.03	1.81		mg/Kg	☼	89	65 - 114
4-Chloroaniline	ND		2.03	1.14		mg/Kg	☼	56	38 - 90
Fluorene	ND		2.03	1.55		mg/Kg	☼	76	62 - 110
4-Chlorophenyl-phenyl ether	ND		2.03	1.49		mg/Kg	☼	73	58 - 110
Hexachlorobenzene	ND		2.03	1.62		mg/Kg	☼	80	69 - 116
Hexachlorobutadiene	ND		2.03	1.17		mg/Kg	☼	58	49 - 106
Hexachlorocyclopentadiene	ND	F1	2.03	ND	F1	mg/Kg	☼	0	19 - 100
Hexachloroethane	ND	F1 F2	2.03	0.349	F1	mg/Kg	☼	17	48 - 86
Indeno[1,2,3-cd]pyrene	ND		2.03	1.83		mg/Kg	☼	90	71 - 122
Isophorone	ND		2.03	1.40		mg/Kg	☼	69	52 - 103
N-Nitrosodi-n-propylamine	ND		2.03	1.34		mg/Kg	☼	66	51 - 100
N-Nitrosodiphenylamine	ND		1.72	1.48		mg/Kg	☼	86	74 - 115
Naphthalene	ND		2.03	1.28		mg/Kg	☼	63	60 - 94
Nitrobenzene	ND		2.03	1.23		mg/Kg	☼	61	50 - 99

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-21427-9 MS
Matrix: Soil
Analysis Batch: 70185

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68893

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenanthrene	ND		2.03	1.71		mg/Kg	☼	84	74 - 112
Aniline	ND		2.03	0.805		mg/Kg	☼	40	37 - 77
Phenol	ND		2.03	1.47		mg/Kg	☼	72	54 - 100
Pyrene	0.011	J	2.03	1.69		mg/Kg	☼	83	70 - 103
Pentachlorophenol	ND		4.05	3.00		mg/Kg	☼	74	51 - 121
Benzyl alcohol	ND		2.03	1.35		mg/Kg	☼	66	44 - 109
Pyridine	ND		4.05	1.45		mg/Kg	☼	36	30 - 62
1,4-Dioxane	ND		2.03	0.647		mg/Kg	☼	32	20 - 53

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
p-Terphenyl-d14 (Surr)	*90*		*45 - 108*
Nitrobenzene-d5 (Surr)	*58*		*32 - 97*
2-Fluorophenol (Surr)	*65*		*26 - 96*
2-Fluorobiphenyl (Surr)	*71*		*39 - 100*
2,4,6-Tribromophenol (Surr)	*65*		*13 - 121*
Phenol-d5 (Surr)	*75*		*27 - 104*

Lab Sample ID: 410-21427-9 MSD
Matrix: Soil
Analysis Batch: 70185

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68893

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1'-Biphenyl	ND		2.02	1.65		mg/Kg	☼	82	59 - 106	18	30
1,2,4,5-Tetrachlorobenzene	ND		2.02	1.52		mg/Kg	☼	75	60 - 102	20	30
2,2'-oxybis[1-chloropropane]	ND		2.02	1.52		mg/Kg	☼	75	44 - 105	23	30
2,3,4,6-Tetrachlorophenol	ND		2.02	1.68		mg/Kg	☼	83	66 - 116	20	30
2,4,5-Trichlorophenol	ND		2.02	1.58		mg/Kg	☼	78	67 - 110	13	30
2,4,6-Trichlorophenol	ND		2.02	1.60		mg/Kg	☼	79	60 - 120	14	30
2,4-Dichlorophenol	ND		2.02	1.73		mg/Kg	☼	86	64 - 109	22	30
2,4-Dimethylphenol	ND	F1	2.02	1.85	F1	mg/Kg	☼	92	46 - 88	20	30
2,4-Dinitrophenol	ND	F1 F2	4.04	1.77	F1 F2	mg/Kg	☼	44	47 - 126	62	30
2,4-Dinitrotoluene	ND		2.02	1.83		mg/Kg	☼	91	67 - 115	12	30
2,6-Dinitrotoluene	ND		2.02	1.87		mg/Kg	☼	93	67 - 113	12	30
2-Chloronaphthalene	ND		2.02	1.72		mg/Kg	☼	85	56 - 112	19	30
2-Chlorophenol	ND		2.02	1.66		mg/Kg	☼	82	59 - 97	20	30
2-Methylnaphthalene	0.0042	J	2.02	1.80		mg/Kg	☼	89	63 - 101	21	30
2-Methylphenol	ND		2.02	1.82		mg/Kg	☼	90	56 - 105	17	30
2-Nitroaniline	ND		2.02	1.72		mg/Kg	☼	85	63 - 119	10	30
2-Nitrophenol	ND	F1 F2	2.02	1.01	F1 F2	mg/Kg	☼	50	55 - 104	60	30
3,3'-Dichlorobenzidine	ND	F1 F2	4.04	1.58	F1 F2	mg/Kg	☼	39	40 - 107	32	30
3-Nitroaniline	ND		2.02	1.83		mg/Kg	☼	91	59 - 124	3	30
4,6-Dinitro-2-methylphenol	ND	F1 F2	4.04	3.20	F2	mg/Kg	☼	79	63 - 126	35	30
4-Bromophenyl-phenylether	ND		2.02	1.92		mg/Kg	☼	95	68 - 114	14	30
4-Chloro-3-methylphenol	ND		2.02	1.87		mg/Kg	☼	93	62 - 117	13	30
3,4-Methylphenol	ND		2.02	1.65		mg/Kg	☼	82	56 - 100	16	30
4-Nitroaniline	ND		2.02	1.89		mg/Kg	☼	93	45 - 99	12	30
4-Nitrophenol	ND		4.04	3.49		mg/Kg	☼	87	52 - 114	14	30
Acenaphthene	ND		2.02	1.73		mg/Kg	☼	86	61 - 104	14	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-21427-9 MSD
Matrix: Soil
Analysis Batch: 70185

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68893

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthylene	ND		2.02	2.26		mg/Kg	☼	112	59 - 116	17	30
Acetophenone	ND		2.02	1.49		mg/Kg	☼	74	54 - 95	23	30
Anthracene	ND		2.02	2.07		mg/Kg	☼	103	75 - 114	11	30
Atrazine	ND		2.04	2.03		mg/Kg	☼	99	76 - 120	10	30
Benzaldehyde	ND		2.04	1.50		mg/Kg	☼	74	18 - 88	25	30
Benzo[a]anthracene	ND		2.02	2.06		mg/Kg	☼	102	73 - 114	15	30
Benzo[a]pyrene	ND		2.02	1.89		mg/Kg	☼	93	76 - 113	9	30
Benzo[b]fluoranthene	ND		2.02	1.89		mg/Kg	☼	93	73 - 117	9	30
Benzo[g,h,i]perylene	ND		2.02	1.92		mg/Kg	☼	95	77 - 114	9	30
Benzo[k]fluoranthene	ND		2.02	1.94		mg/Kg	☼	96	66 - 122	9	30
Bis(2-chloroethoxy)methane	ND		2.02	1.53		mg/Kg	☼	76	53 - 101	24	30
Bis(2-chloroethyl)ether	ND		2.02	1.47		mg/Kg	☼	73	49 - 94	25	30
Bis(2-ethylhexyl) phthalate	ND		2.02	1.99		mg/Kg	☼	99	62 - 123	11	30
Butylbenzylphthalate	ND		2.02	1.99		mg/Kg	☼	99	62 - 123	13	30
Caprolactam	ND	F1	2.04	1.61		mg/Kg	☼	79	66 - 109	20	30
Carbazole	ND		2.02	2.06		mg/Kg	☼	102	74 - 117	11	30
Chrysene	ND		2.02	1.95		mg/Kg	☼	96	66 - 111	9	30
Di-n-butyl phthalate	ND		2.02	2.03		mg/Kg	☼	101	70 - 126	12	30
Di-n-octyl phthalate	ND		2.02	2.10		mg/Kg	☼	104	60 - 133	13	30
Dibenz(a,h)anthracene	ND		2.02	1.97		mg/Kg	☼	98	81 - 121	8	30
Dibenzofuran	ND		2.02	1.78		mg/Kg	☼	88	62 - 113	12	30
Diethyl phthalate	ND		2.02	1.82		mg/Kg	☼	90	68 - 116	12	30
Dimethyl phthalate	ND		2.02	1.91		mg/Kg	☼	95	66 - 113	11	30
Fluoranthene	0.0089	J	2.02	2.12		mg/Kg	☼	105	65 - 114	16	30
4-Chloroaniline	ND		2.02	1.21		mg/Kg	☼	60	38 - 90	6	30
Fluorene	ND		2.02	1.76		mg/Kg	☼	87	62 - 110	13	30
4-Chlorophenyl-phenyl ether	ND		2.02	1.69		mg/Kg	☼	84	58 - 110	13	30
Hexachlorobenzene	ND		2.02	1.82		mg/Kg	☼	90	69 - 116	12	30
Hexachlorobutadiene	ND		2.02	1.51		mg/Kg	☼	75	49 - 106	26	30
Hexachlorocyclopentadiene	ND	F1	2.02	ND	F1	mg/Kg	☼	0	19 - 100	NC	30
Hexachloroethane	ND	F1 F2	2.02	0.650	F1 F2	mg/Kg	☼	32	48 - 86	60	30
Indeno[1,2,3-cd]pyrene	ND		2.02	1.99		mg/Kg	☼	98	71 - 122	8	30
Isophorone	ND		2.02	1.72		mg/Kg	☼	85	52 - 103	20	30
N-Nitrosodi-n-propylamine	ND		2.02	1.67		mg/Kg	☼	83	51 - 100	22	30
N-Nitrosodiphenylamine	ND		1.72	1.68		mg/Kg	☼	98	74 - 115	12	30
Naphthalene	ND		2.02	1.65		mg/Kg	☼	82	60 - 94	25	30
Nitrobenzene	ND		2.02	1.56		mg/Kg	☼	77	50 - 99	24	30
Phenanthrene	ND		2.02	1.94		mg/Kg	☼	96	74 - 112	12	30
Aniline	ND		2.02	0.883		mg/Kg	☼	44	37 - 77	9	30
Phenol	ND		2.02	1.78		mg/Kg	☼	88	54 - 100	19	30
Pyrene	0.011	J	2.02	1.91		mg/Kg	☼	94	70 - 103	12	30
Pentachlorophenol	ND		4.04	3.72		mg/Kg	☼	92	51 - 121	22	30
Benzyl alcohol	ND		2.02	1.71		mg/Kg	☼	85	44 - 109	24	30
Pyridine	ND		4.04	1.74		mg/Kg	☼	43	30 - 62	18	30
1,4-Dioxane	ND		2.02	0.753		mg/Kg	☼	37	20 - 53	15	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
p-Terphenyl-d14 (Surr)	*101*		*45 - 108*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-21427-9 MSD
Matrix: Soil
Analysis Batch: 70185

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68893

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Nitrobenzene-d5 (Surr)	*74*		*32 - 97*
2-Fluorophenol (Surr)	*83*		*26 - 96*
2-Fluorobiphenyl (Surr)	*84*		*39 - 100*
2,4,6-Tribromophenol (Surr)	*78*		*13 - 121*
Phenol-d5 (Surr)	*89*		*27 - 104*

Lab Sample ID: MB 410-70315/1-A
Matrix: Water
Analysis Batch: 71761

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70315

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
1,2,4,5-Tetrachlorobenzene	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
2,2'-oxybis[1-chloropropane]	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
2,3,4,6-Tetrachlorophenol	ND		10	4.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
2,4,5-Trichlorophenol	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
2,4,6-Trichlorophenol	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
2,4-Dichlorophenol	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
2,4-Dimethylphenol	ND		10	3.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
2,4-Dinitrophenol	ND		30	14	ug/L		11/25/20 10:15	12/02/20 04:14	1
2,4-Dinitrotoluene	ND		5.0	1.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
2,6-Dinitrotoluene	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
2-Chloronaphthalene	ND		1.0	0.40	ug/L		11/25/20 10:15	12/02/20 04:14	1
2-Chlorophenol	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
2-Methylnaphthalene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
2-Methylphenol	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
2-Nitroaniline	ND		5.0	2.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
2-Nitrophenol	ND		10	3.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
3,3'-Dichlorobenzidine	ND		10	3.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
3-Nitroaniline	ND		7.0	3.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
4,6-Dinitro-2-methylphenol	ND		21	8.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
4-Bromophenyl-phenylether	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
4-Chloro-3-methylphenol	ND		3.5	1.6	ug/L		11/25/20 10:15	12/02/20 04:14	1
3,4-Methylphenol	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
4-Nitroaniline	ND		3.0	0.90	ug/L		11/25/20 10:15	12/02/20 04:14	1
4-Nitrophenol	ND		30	10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Acenaphthene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Acenaphthylene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Acetophenone	ND		10	4.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Anthracene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Atrazine	ND		5.0	2.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Benzaldehyde	ND		10	3.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Benzo[a]anthracene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Benzo[a]pyrene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Benzo[b]fluoranthene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Benzo[g,h,i]perylene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Benzo[k]fluoranthene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Butylbenzylphthalate	ND		5.0	2.0	ug/L		11/25/20 10:15	12/02/20 04:14	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-70315/1-A
Matrix: Water
Analysis Batch: 71761

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70315

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Caprolactam	ND		11	5.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Carbazole	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
Chrysene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Di-n-butyl phthalate	ND		5.0	2.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Di-n-octyl phthalate	ND		11	5.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Dibenz(a,h)anthracene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Dibenzofuran	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
Diethyl phthalate	ND		5.0	2.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
4-Chloroaniline	ND		10	4.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Dimethyl phthalate	ND		5.0	2.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Fluoranthene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
4-Chlorophenyl-phenyl ether	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
Fluorene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Hexachlorobenzene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Hexachlorobutadiene	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
Hexachlorocyclopentadiene	ND		11	5.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Hexachloroethane	ND		5.0	1.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Indeno[1,2,3-cd]pyrene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Isophorone	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
N-Nitrosodi-n-propylamine	ND		3.0	0.70	ug/L		11/25/20 10:15	12/02/20 04:14	1
N-Nitrosodiphenylamine	ND		3.0	0.70	ug/L		11/25/20 10:15	12/02/20 04:14	1
Naphthalene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Nitrobenzene	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
Aniline	ND		10	3.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Phenanthrene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Phenol	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
Pentachlorophenol	ND		5.0	1.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Pyrene	ND		0.50	0.10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Bis(2-chloroethoxy)methane	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
Bis(2-chloroethyl)ether	ND		2.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
Bis(2-ethylhexyl) phthalate	ND		11	5.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Benzyl alcohol	ND		30	10	ug/L		11/25/20 10:15	12/02/20 04:14	1
Dicyclohexylamine	ND		20	10	ug/L		11/25/20 10:15	12/02/20 04:14	1
n,n'-Dimethylaniline	ND		1.0	0.50	ug/L		11/25/20 10:15	12/02/20 04:14	1
Pyridine	ND		5.0	2.0	ug/L		11/25/20 10:15	12/02/20 04:14	1
Triethylamine	ND		10	10	ug/L		11/25/20 10:15	12/02/20 04:14	1
1,4-Dioxane	ND		5.0	2.0	ug/L		11/25/20 10:15	12/02/20 04:14	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*11/25/20 10:15*	*12/02/20 04:14*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*71*		*10 - 150*	*11/25/20 10:15*	*12/02/20 04:14*	*1*
2-Fluorobiphenyl (Surr)	*56*		*44 - 102*	*11/25/20 10:15*	*12/02/20 04:14*	*1*
2-Fluorophenol (Surr)	*40*		*10 - 84*	*11/25/20 10:15*	*12/02/20 04:14*	*1*
Nitrobenzene-d5 (Surr)	*56*		*23 - 128*	*11/25/20 10:15*	*12/02/20 04:14*	*1*
p-Terphenyl-d14 (Surr)	*81*		*31 - 113*	*11/25/20 10:15*	*12/02/20 04:14*	*1*
Phenol-d5 (Surr)	*31*		*10 - 67*	*11/25/20 10:15*	*12/02/20 04:14*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LCS 410-70315/2-A
Matrix: Water
Analysis Batch: 71761

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 70315

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	50.0	42.8		ug/L		86	50 - 110
1,2,4,5-Tetrachlorobenzene	50.0	38.5		ug/L		77	32 - 113
2,2'-oxybis[1-chloropropane]	50.0	43.8		ug/L		88	41 - 118
2,3,4,6-Tetrachlorophenol	50.0	48.6		ug/L		97	64 - 130
2,4,5-Trichlorophenol	50.0	50.6		ug/L		101	59 - 126
2,4,6-Trichlorophenol	50.0	49.6		ug/L		99	59 - 129
2,4-Dichlorophenol	50.0	47.0		ug/L		94	51 - 123
2,4-Dimethylphenol	50.0	46.0		ug/L		92	43 - 102
2,4-Dinitrophenol	100	82.0		ug/L		82	30 - 143
2,4-Dinitrotoluene	50.0	47.0		ug/L		94	52 - 128
2,6-Dinitrotoluene	50.0	50.6		ug/L		101	61 - 121
2-Chloronaphthalene	50.0	42.8		ug/L		86	43 - 110
2-Chlorophenol	50.0	43.5		ug/L		87	46 - 109
2-Methylnaphthalene	50.0	43.7		ug/L		87	45 - 108
2-Methylphenol	50.0	43.1		ug/L		86	41 - 113
2-Nitroaniline	50.0	51.6		ug/L		103	60 - 123
2-Nitrophenol	50.0	44.8		ug/L		90	53 - 123
3,3'-Dichlorobenzidine	100	80.5		ug/L		80	42 - 107
3-Nitroaniline	50.0	40.0		ug/L		80	54 - 112
4,6-Dinitro-2-methylphenol	100	92.3		ug/L		92	49 - 138
4-Bromophenyl-phenylether	50.0	45.3		ug/L		91	54 - 121
4-Chloro-3-methylphenol	50.0	47.1		ug/L		94	52 - 126
3,4-Methylphenol	50.0	39.2		ug/L		78	41 - 109
4-Nitroaniline	50.0	45.3		ug/L		91	49 - 107
4-Nitrophenol	100	51.4		ug/L		51	23 - 89
Acenaphthene	50.0	45.0		ug/L		90	52 - 114
Acenaphthylene	50.0	54.2		ug/L		108	55 - 117
Acetophenone	50.0	43.3		ug/L		87	51 - 119
Anthracene	50.0	48.7		ug/L		97	61 - 117
Atrazine	50.4	46.5		ug/L		92	71 - 133
Benzaldehyde	50.5	41.6		ug/L		82	39 - 119
Benzo[a]anthracene	50.0	51.0		ug/L		102	61 - 126
Benzo[a]pyrene	50.0	48.4		ug/L		97	60 - 116
Benzo[b]fluoranthene	50.0	46.7		ug/L		93	61 - 119
Benzo[g,h,i]perylene	50.0	54.6		ug/L		109	54 - 120
Benzo[k]fluoranthene	50.0	52.3		ug/L		105	69 - 122
Butylbenzylphthalate	50.0	34.4		ug/L		69	11 - 125
Caprolactam	50.5	10.9	J	ug/L		22	12 - 40
Carbazole	50.0	48.4		ug/L		97	64 - 127
Chrysene	50.0	50.1		ug/L		100	65 - 121
Di-n-butyl phthalate	50.0	44.2		ug/L		88	43 - 118
Di-n-octyl phthalate	50.0	46.2		ug/L		92	48 - 129
Dibenz(a,h)anthracene	50.0	52.6		ug/L		105	57 - 124
Dibenzofuran	50.0	46.2		ug/L		92	60 - 112
Diethyl phthalate	50.0	40.3		ug/L		81	19 - 121
4-Chloroaniline	50.0	36.6		ug/L		73	45 - 93
Dimethyl phthalate	50.0	28.5		ug/L		57	10 - 134
Fluoranthene	50.0	48.5		ug/L		97	63 - 122

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-70315/2-A
Matrix: Water
Analysis Batch: 71761

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 70315

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorophenyl-phenyl ether	50.0	43.8		ug/L		88	47 - 121
Fluorene	50.0	47.3		ug/L		95	56 - 115
Hexachlorobenzene	50.0	46.2		ug/L		92	55 - 123
Hexachlorobutadiene	50.0	29.4		ug/L		59	20 - 108
Hexachlorocyclopentadiene	50.0	20.2		ug/L		40	10 - 42
Hexachloroethane	50.0	27.0		ug/L		54	22 - 88
Indeno[1,2,3-cd]pyrene	50.0	51.5		ug/L		103	52 - 121
Isophorone	50.0	49.8		ug/L		100	55 - 122
N-Nitrosodi-n-propylamine	50.0	46.9		ug/L		94	52 - 123
N-Nitrosodiphenylamine	42.5	40.9		ug/L		96	60 - 126
Naphthalene	50.0	41.9		ug/L		84	51 - 102
Nitrobenzene	50.0	44.9		ug/L		90	52 - 119
Aniline	50.0	31.7		ug/L		63	26 - 75
Phenanthrene	50.0	46.8		ug/L		94	65 - 113
Phenol	50.0	24.7		ug/L		49	22 - 69
Pentachlorophenol	100	91.0		ug/L		91	54 - 131
Pyrene	50.0	48.2		ug/L		96	65 - 115
Bis(2-chloroethoxy)methane	50.0	44.5		ug/L		89	51 - 120
Bis(2-chloroethyl)ether	50.0	44.4		ug/L		89	50 - 110
Bis(2-ethylhexyl) phthalate	50.0	46.6		ug/L		93	50 - 127
Benzyl alcohol	50.0	45.0		ug/L		90	56 - 115
Pyridine	100	42.0		ug/L		42	23 - 64
1,4-Dioxane	50.0	21.3		ug/L		43	21 - 64

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*89*		*10 - 150*
2-Fluorobiphenyl (Surr)	*78*		*44 - 102*
2-Fluorophenol (Surr)	*56*		*10 - 84*
Nitrobenzene-d5 (Surr)	*82*		*23 - 128*
p-Terphenyl-d14 (Surr)	*90*		*31 - 113*
Phenol-d5 (Surr)	*44*		*10 - 67*

Lab Sample ID: LCS 410-70315/3-A
Matrix: Water
Analysis Batch: 71761

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 70315

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dicyclohexylamine	50.1	10.8	J *-	ug/L		22	28 - 140
n,n'-Dimethylaniline	25.2	21.7		ug/L		86	59 - 114
Triethylamine	50.2	17.9		ug/L		36	10 - 88

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*89*		*10 - 150*
2-Fluorobiphenyl (Surr)	*73*		*44 - 102*
2-Fluorophenol (Surr)	*56*		*10 - 84*
Nitrobenzene-d5 (Surr)	*81*		*23 - 128*
p-Terphenyl-d14 (Surr)	*93*		*31 - 113*
Phenol-d5 (Surr)	*45*		*10 - 67*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LCSD 410-70315/4-A
Matrix: Water
Analysis Batch: 71761

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 70315

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dicyclohexylamine			50.1	ND	*- *1	ug/L		14	28 - 140	45	30
n,n'-Dimethylaniline			25.2	22.8		ug/L		90	59 - 114	5	30
Triethylamine			50.2	16.7		ug/L		33	10 - 88	7	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*87*		*10 - 150*
2-Fluorobiphenyl (Surr)	*70*		*44 - 102*
2-Fluorophenol (Surr)	*54*		*10 - 84*
Nitrobenzene-d5 (Surr)	*79*		*23 - 128*
p-Terphenyl-d14 (Surr)	*89*		*31 - 113*
Phenol-d5 (Surr)	*44*		*10 - 67*

Method: 8315A - Carbonyl Compounds by HPLC

Lab Sample ID: MB 410-68417/1-A
Matrix: Water
Analysis Batch: 69590

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 68417

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 18:32	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 18:32	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*98*		*39 - 153*	*11/20/20 16:15*	*11/23/20 18:32*	*1*

Lab Sample ID: LCS 410-68417/2-A
Matrix: Water
Analysis Batch: 69590

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 68417

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetaldehyde			499	524		ug/L		105	76 - 119
Formaldehyde			503	470		ug/L		93	77 - 122
Glutaraldehyde			503	547		ug/L		109	79 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Butyraldehyde	*97*		*39 - 153*

Lab Sample ID: LCSD 410-68417/3-A
Matrix: Water
Analysis Batch: 69590

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 68417

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetaldehyde			499	523		ug/L		105	76 - 119	0	30
Formaldehyde			503	464		ug/L		92	77 - 122	1	30
Glutaraldehyde			503	539		ug/L		107	79 - 127	1	30

Method: 8315A - Carbonyl Compounds by HPLC (Continued)

Lab Sample ID: LCSD 410-68417/3-A
Matrix: Water
Analysis Batch: 69590

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 68417

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Butyraldehyde	94		39 - 153

Lab Sample ID: MB 410-68967/1-A
Matrix: Solid
Analysis Batch: 69590

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 68967

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.050	0.025	mg/Kg		11/22/20 09:12	11/24/20 00:39	1
Formaldehyde	ND		0.075	0.025	mg/Kg		11/22/20 09:12	11/24/20 00:39	1
Glutaraldehyde	ND		0.050	0.025	mg/Kg		11/22/20 09:12	11/24/20 00:39	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	101		77 - 133	11/22/20 09:12	11/24/20 00:39	1

Lab Sample ID: LCS 410-68967/2-A
Matrix: Solid
Analysis Batch: 69590

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 68967

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetaldehyde	0.499	0.559		mg/Kg		112	83 - 115
Formaldehyde	0.503	0.493		mg/Kg		98	81 - 120
Glutaraldehyde	0.503	0.532		mg/Kg		106	84 - 123

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Butyraldehyde	103		77 - 133

Lab Sample ID: 410-21427-9 MS
Matrix: Soil
Analysis Batch: 69590

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68967

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetaldehyde	ND		0.609	0.683		mg/Kg	☼	112	83 - 115
Formaldehyde	0.11		0.615	0.728		mg/Kg	☼	101	81 - 120
Glutaraldehyde	ND		0.615	0.609		mg/Kg	☼	99	84 - 123

Surrogate	MS %Recovery	MS Qualifier	Limits
Butyraldehyde	100		77 - 133

Lab Sample ID: 410-21427-9 MSD
Matrix: Soil
Analysis Batch: 69590

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68967

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetaldehyde	ND		0.609	0.692		mg/Kg	☼	114	83 - 115	1	50
Formaldehyde	0.11		0.615	0.724		mg/Kg	☼	100	81 - 120	1	50
Glutaraldehyde	ND		0.615	0.639		mg/Kg	☼	104	84 - 123	5	50

Method: 8315A - Carbonyl Compounds by HPLC (Continued)

Lab Sample ID: 410-21427-9 MSD
Matrix: Soil
Analysis Batch: 69590

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Prep Type: Total/NA
Prep Batch: 68967

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Butyraldehyde	*101*		*77 - 133*

GC/MS VOA

Prep Batch: 68357

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	5035	
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	5035	
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	5035	
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	5035	
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	5035	

Prep Batch: 68364

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-10 - DL	B55-PDI-SB-10 (9-10)	Total/NA	Soil	5035	
410-21427-10	B55-PDI-SB-10 (9-10)	Total/NA	Soil	5035	
410-21427-11 - DL	DUP111820	Total/NA	Soil	5035	
410-21427-11	DUP111820	Total/NA	Soil	5035	

Analysis Batch: 69809

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8260C	68357
MB 410-69809/10	Method Blank	Total/NA	Solid	8260C	
LCS 410-69809/5	Lab Control Sample	Total/NA	Solid	8260C	
LCS 410-69809/7	Lab Control Sample	Total/NA	Solid	8260C	
LCSD 410-69809/6	Lab Control Sample Dup	Total/NA	Solid	8260C	
LCSD 410-69809/8	Lab Control Sample Dup	Total/NA	Solid	8260C	
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8260C	68357
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8260C	68357
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8260C	68357
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8260C	68357

Analysis Batch: 70130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-10	B55-PDI-SB-10 (9-10)	Total/NA	Soil	8260C	68364
410-21427-10 - DL	B55-PDI-SB-10 (9-10)	Total/NA	Soil	8260C	68364
410-21427-11	DUP111820	Total/NA	Soil	8260C	68364
410-21427-11 - DL	DUP111820	Total/NA	Soil	8260C	68364
MB 410-70130/9	Method Blank	Total/NA	Solid	8260C	
LCS 410-70130/5	Lab Control Sample	Total/NA	Solid	8260C	
LCS 410-70130/7	Lab Control Sample	Total/NA	Solid	8260C	
LCSD 410-70130/6	Lab Control Sample Dup	Total/NA	Solid	8260C	
LCSD 410-70130/8	Lab Control Sample Dup	Total/NA	Solid	8260C	

Analysis Batch: 71355

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-1	EB111820W	Total/NA	Groundwater	8260C	
410-21427-2	B55-PDI-SB-03	Total/NA	Groundwater	8260C	
410-21427-3	B55-PDI-SB-04	Total/NA	Groundwater	8260C	
410-21427-4	B55-PDI-SB-05	Total/NA	Groundwater	8260C	
410-21427-5	B55-PDI-SB-07	Total/NA	Groundwater	8260C	
410-21427-6	B55-PDI-SB-15	Total/NA	Groundwater	8260C	
410-21427-7	B55-PDI-SB-16	Total/NA	Groundwater	8260C	
410-21427-8	B55-PDI-SB-18	Total/NA	Groundwater	8260C	
410-21427-12	TB20308	Total/NA	Water	8260C	
MB 410-71355/9	Method Blank	Total/NA	Water	8260C	
LCS 410-71355/6	Lab Control Sample	Total/NA	Water	8260C	

GC/MS VOA (Continued)

Analysis Batch: 71355 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 410-71355/7	Lab Control Sample	Total/NA	Water	8260C	

Analysis Batch: 71948

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-3 - DL	B55-PDI-SB-04	Total/NA	Groundwater	8260C	
MB 410-71948/12	Method Blank	Total/NA	Water	8260C	
LCS 410-71948/8	Lab Control Sample	Total/NA	Water	8260C	

GC/MS Semi VOA

Prep Batch: 68893

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-9 - DL	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	3546	
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	3546	
410-21427-10	B55-PDI-SB-10 (9-10)	Total/NA	Soil	3546	
410-21427-10 - DL	B55-PDI-SB-10 (9-10)	Total/NA	Soil	3546	
410-21427-11 - DL	DUP111820	Total/NA	Soil	3546	
410-21427-11	DUP111820	Total/NA	Soil	3546	
MB 410-68893/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-68893/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCS 410-68893/7-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 410-68893/8-A	Lab Control Sample Dup	Total/NA	Solid	3546	
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	3546	
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	3546	

Analysis Batch: 70185

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8270D	68893
410-21427-10	B55-PDI-SB-10 (9-10)	Total/NA	Soil	8270D	68893
MB 410-68893/1-A	Method Blank	Total/NA	Solid	8270D	68893
LCS 410-68893/2-A	Lab Control Sample	Total/NA	Solid	8270D	68893
LCS 410-68893/7-A	Lab Control Sample	Total/NA	Solid	8270D	68893
LCSD 410-68893/8-A	Lab Control Sample Dup	Total/NA	Solid	8270D	68893
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8270D	68893
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8270D	68893

Prep Batch: 70315

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-1	EB111820W	Total/NA	Groundwater	3510C	
410-21427-2	B55-PDI-SB-03	Total/NA	Groundwater	3510C	
410-21427-3 - DL	B55-PDI-SB-04	Total/NA	Groundwater	3510C	
410-21427-3	B55-PDI-SB-04	Total/NA	Groundwater	3510C	
410-21427-4	B55-PDI-SB-05	Total/NA	Groundwater	3510C	
410-21427-5	B55-PDI-SB-07	Total/NA	Groundwater	3510C	
410-21427-6	B55-PDI-SB-15	Total/NA	Groundwater	3510C	
410-21427-7	B55-PDI-SB-16	Total/NA	Groundwater	3510C	
410-21427-8	B55-PDI-SB-18	Total/NA	Groundwater	3510C	
MB 410-70315/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-70315/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCS 410-70315/3-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-70315/4-A	Lab Control Sample Dup	Total/NA	Water	3510C	

GC/MS Semi VOA

Analysis Batch: 70671

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-11 - DL	DUP111820	Total/NA	Soil	8270D	68893

Analysis Batch: 70935

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-11	DUP111820	Total/NA	Soil	8270D	68893

Analysis Batch: 71761

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-1	EB111820W	Total/NA	Groundwater	8270D	70315
410-21427-2	B55-PDI-SB-03	Total/NA	Groundwater	8270D	70315
410-21427-3	B55-PDI-SB-04	Total/NA	Groundwater	8270D	70315
410-21427-4	B55-PDI-SB-05	Total/NA	Groundwater	8270D	70315
MB 410-70315/1-A	Method Blank	Total/NA	Water	8270D	70315
LCS 410-70315/2-A	Lab Control Sample	Total/NA	Water	8270D	70315
LCS 410-70315/3-A	Lab Control Sample	Total/NA	Water	8270D	70315
LCSD 410-70315/4-A	Lab Control Sample Dup	Total/NA	Water	8270D	70315

Analysis Batch: 71928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-3 - DL	B55-PDI-SB-04	Total/NA	Groundwater	8270D	70315
410-21427-5	B55-PDI-SB-07	Total/NA	Groundwater	8270D	70315
410-21427-6	B55-PDI-SB-15	Total/NA	Groundwater	8270D	70315
410-21427-7	B55-PDI-SB-16	Total/NA	Groundwater	8270D	70315
410-21427-8	B55-PDI-SB-18	Total/NA	Groundwater	8270D	70315

Analysis Batch: 71938

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-10 - DL	B55-PDI-SB-10 (9-10)	Total/NA	Soil	8270D	68893

Analysis Batch: 72348

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-9 - DL	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8270D	68893

HPLC/IC

Prep Batch: 68417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-1	EB111820W	Total/NA	Groundwater	8315A Prep	
410-21427-2	B55-PDI-SB-03	Total/NA	Groundwater	8315A Prep	
410-21427-3	B55-PDI-SB-04	Total/NA	Groundwater	8315A Prep	
410-21427-4	B55-PDI-SB-05	Total/NA	Groundwater	8315A Prep	
410-21427-5	B55-PDI-SB-07	Total/NA	Groundwater	8315A Prep	
410-21427-6	B55-PDI-SB-15	Total/NA	Groundwater	8315A Prep	
410-21427-7	B55-PDI-SB-16	Total/NA	Groundwater	8315A Prep	
410-21427-8	B55-PDI-SB-18	Total/NA	Groundwater	8315A Prep	
MB 410-68417/1-A	Method Blank	Total/NA	Water	8315A Prep	
LCS 410-68417/2-A	Lab Control Sample	Total/NA	Water	8315A Prep	
LCSD 410-68417/3-A	Lab Control Sample Dup	Total/NA	Water	8315A Prep	

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

HPLC/IC

Prep Batch: 68967

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8315A Prep	
410-21427-10	B55-PDI-SB-10 (9-10)	Total/NA	Soil	8315A Prep	
410-21427-11	DUP111820	Total/NA	Soil	8315A Prep	
MB 410-68967/1-A	Method Blank	Total/NA	Solid	8315A Prep	
LCS 410-68967/2-A	Lab Control Sample	Total/NA	Solid	8315A Prep	
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8315A Prep	
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8315A Prep	

Analysis Batch: 69590

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-1	EB111820W	Total/NA	Groundwater	8315A	68417
410-21427-2	B55-PDI-SB-03	Total/NA	Groundwater	8315A	68417
410-21427-3	B55-PDI-SB-04	Total/NA	Groundwater	8315A	68417
410-21427-4	B55-PDI-SB-05	Total/NA	Groundwater	8315A	68417
410-21427-5	B55-PDI-SB-07	Total/NA	Groundwater	8315A	68417
410-21427-6	B55-PDI-SB-15	Total/NA	Groundwater	8315A	68417
410-21427-7	B55-PDI-SB-16	Total/NA	Groundwater	8315A	68417
410-21427-8	B55-PDI-SB-18	Total/NA	Groundwater	8315A	68417
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8315A	68967
410-21427-10	B55-PDI-SB-10 (9-10)	Total/NA	Soil	8315A	68967
410-21427-11	DUP111820	Total/NA	Soil	8315A	68967
MB 410-68417/1-A	Method Blank	Total/NA	Water	8315A	68417
MB 410-68967/1-A	Method Blank	Total/NA	Solid	8315A	68967
LCS 410-68417/2-A	Lab Control Sample	Total/NA	Water	8315A	68417
LCS 410-68967/2-A	Lab Control Sample	Total/NA	Solid	8315A	68967
LCSD 410-68417/3-A	Lab Control Sample Dup	Total/NA	Water	8315A	68417
410-21427-9 MS	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8315A	68967
410-21427-9 MSD	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	8315A	68967

General Chemistry

Analysis Batch: 68370

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	Total/NA	Soil	Moisture	
410-21427-10	B55-PDI-SB-10 (9-10)	Total/NA	Soil	Moisture	
410-21427-11	DUP111820	Total/NA	Soil	Moisture	

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: EB111820W
Date Collected: 11/18/20 08:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-1
Matrix: Groundwater

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	71355	12/01/20 13:21	NSK7	ELLE
Total/NA	Prep	3510C			70315	11/25/20 10:15	U2SJ	ELLE
Total/NA	Analysis	8270D		1	71761	12/02/20 06:06	W6XI	ELLE
Total/NA	Prep	8315A Prep			68417	11/20/20 16:15	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 20:16	GM5C	ELLE

Client Sample ID: B55-PDI-SB-03
Date Collected: 11/18/20 08:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-2
Matrix: Groundwater

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	71355	12/01/20 16:40	NSK7	ELLE
Total/NA	Prep	3510C			70315	11/25/20 10:15	U2SJ	ELLE
Total/NA	Analysis	8270D		1	71761	12/02/20 06:34	W6XI	ELLE
Total/NA	Prep	8315A Prep			68417	11/20/20 16:15	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 20:27	GM5C	ELLE

Client Sample ID: B55-PDI-SB-04
Date Collected: 11/18/20 08:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-3
Matrix: Groundwater

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	71355	12/01/20 17:02	NSK7	ELLE
Total/NA	Analysis	8260C	DL	10	71948	12/02/20 17:59	H9JD	ELLE
Total/NA	Prep	3510C			70315	11/25/20 10:15	U2SJ	ELLE
Total/NA	Analysis	8270D		1	71761	12/02/20 07:02	W6XI	ELLE
Total/NA	Prep	3510C	DL		70315	11/25/20 10:15	U2SJ	ELLE
Total/NA	Analysis	8270D	DL	10	71928	12/02/20 17:10	WKV3	ELLE
Total/NA	Prep	8315A Prep			68417	11/20/20 16:15	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 20:39	GM5C	ELLE

Client Sample ID: B55-PDI-SB-05
Date Collected: 11/18/20 09:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-4
Matrix: Groundwater

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	71355	12/01/20 17:24	NSK7	ELLE
Total/NA	Prep	3510C			70315	11/25/20 10:15	U2SJ	ELLE
Total/NA	Analysis	8270D		1	71761	12/02/20 07:30	W6XI	ELLE
Total/NA	Prep	8315A Prep			68417	11/20/20 16:15	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 20:50	GM5C	ELLE

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: B55-PDI-SB-07
Date Collected: 11/18/20 09:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-5
Matrix: Groundwater

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	71355	12/01/20 17:46	NSK7	ELLE
Total/NA	Prep	3510C			70315	11/25/20 10:15	U2SJ	ELLE
Total/NA	Analysis	8270D		1	71928	12/02/20 17:38	WKV3	ELLE
Total/NA	Prep	8315A Prep			68417	11/20/20 16:15	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 21:02	GM5C	ELLE

Client Sample ID: B55-PDI-SB-15
Date Collected: 11/18/20 10:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-6
Matrix: Groundwater

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	71355	12/01/20 18:08	NSK7	ELLE
Total/NA	Prep	3510C			70315	11/25/20 10:15	U2SJ	ELLE
Total/NA	Analysis	8270D		1	71928	12/02/20 18:06	WKV3	ELLE
Total/NA	Prep	8315A Prep			68417	11/20/20 16:15	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 21:13	GM5C	ELLE

Client Sample ID: B55-PDI-SB-16
Date Collected: 11/18/20 10:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-7
Matrix: Groundwater

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	71355	12/01/20 18:30	NSK7	ELLE
Total/NA	Prep	3510C			70315	11/25/20 10:15	U2SJ	ELLE
Total/NA	Analysis	8270D		10	71928	12/02/20 18:34	WKV3	ELLE
Total/NA	Prep	8315A Prep			68417	11/20/20 16:15	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 21:24	GM5C	ELLE

Client Sample ID: B55-PDI-SB-18
Date Collected: 11/18/20 12:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-8
Matrix: Groundwater

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	71355	12/01/20 18:52	NSK7	ELLE
Total/NA	Prep	3510C			70315	11/25/20 10:15	U2SJ	ELLE
Total/NA	Analysis	8270D		1	71928	12/02/20 19:02	WKV3	ELLE
Total/NA	Prep	8315A Prep			68417	11/20/20 16:15	QTH7	ELLE
Total/NA	Analysis	8315A		1	69590	11/23/20 21:36	GM5C	ELLE

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Date Collected: 11/18/20 12:10
Date Received: 11/19/20 11:18

Date Collected is 11/17/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9
Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	68370	11/20/20 00:15	X4C8	ELLE

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Lab Sample ID: 410-21427-9

Date Collected: 11/18/20 12:10
Date Collected is 11/17/20
Date Recorded Here is the Sample Shipment Date

Date Received: 11/19/20 11:18

Matrix: Soil

Percent Solids: 81.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			68357	11/19/20 22:08	ULEH	ELLE
Total/NA	Analysis	8260C		1	69809	11/24/20 18:10	Z6JB	ELLE
Total/NA	Prep	3546			68893	11/21/20 07:13	A2VL	ELLE
Total/NA	Analysis	8270D		1	70185	11/25/20 20:49	ULM3	ELLE
Total/NA	Prep	3546	DL		68893	11/21/20 07:13	A2VL	ELLE
Total/NA	Analysis	8270D	DL	5	72348	12/03/20 11:59	ULM3	ELLE
Total/NA	Prep	8315A Prep			68967	11/22/20 09:12	DN9W	ELLE
Total/NA	Analysis	8315A		1	69590	11/24/20 01:25	GM5C	ELLE

Client Sample ID: B55-PDI-SB-10 (9-10)

Lab Sample ID: 410-21427-10

Date Collected: 11/18/20 12:30
Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Date Received: 11/19/20 11:18

Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	68370	11/20/20 00:15	X4C8	ELLE

Client Sample ID: B55-PDI-SB-10 (9-10)

Lab Sample ID: 410-21427-10

Date Collected: 11/18/20 12:30
Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Date Received: 11/19/20 11:18

Matrix: Soil

Percent Solids: 78.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			68364	11/19/20 23:03	ULEH	ELLE
Total/NA	Analysis	8260C		50	70130	11/25/20 02:26	Z6JB	ELLE
Total/NA	Prep	5035	DL		68364	11/19/20 23:03	ULEH	ELLE
Total/NA	Analysis	8260C	DL	500	70130	11/25/20 02:47	Z6JB	ELLE
Total/NA	Prep	3546			68893	11/21/20 07:13	A2VL	ELLE
Total/NA	Analysis	8270D		1	70185	11/25/20 20:01	ULM3	ELLE
Total/NA	Prep	3546	DL		68893	11/21/20 07:13	A2VL	ELLE
Total/NA	Analysis	8270D	DL	5	71938	12/02/20 15:20	ULM3	ELLE
Total/NA	Prep	8315A Prep			68967	11/22/20 09:12	DN9W	ELLE
Total/NA	Analysis	8315A		1	69590	11/24/20 01:36	GM5C	ELLE

Client Sample ID: DUP111820

Lab Sample ID: 410-21427-11

Date Collected: 11/18/20 00:00
Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Date Received: 11/19/20 11:18

Matrix: Soil

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	68370	11/20/20 00:15	X4C8	ELLE

Client Sample ID: DUP111820

Lab Sample ID: 410-21427-11

Date Collected: 11/18/20 00:00
Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Date Received: 11/19/20 11:18

Matrix: Soil

Percent Solids: 79.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			68364	11/19/20 23:03	ULEH	ELLE
Total/NA	Analysis	8260C		50	70130	11/25/20 03:08	Z6JB	ELLE

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: DUP111820

Date Collected: 11/18/20 00:00 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-11
Matrix: Soil
Percent Solids: 79.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035	DL		68364	11/19/20 23:03	ULEH	ELLE
Total/NA	Analysis	8260C	DL	500	70130	11/25/20 03:29	Z6JB	ELLE
Total/NA	Prep	3546	DL		68893	11/21/20 07:13	A2VL	ELLE
Total/NA	Analysis	8270D	DL	5	70671	11/26/20 16:09	ULM3	ELLE
Total/NA	Prep	3546			68893	11/21/20 07:13	A2VL	ELLE
Total/NA	Analysis	8270D		1	70935	11/30/20 20:19	WKV3	ELLE
Total/NA	Prep	8315A Prep			68967	11/22/20 09:12	DN9W	ELLE
Total/NA	Analysis	8315A		1	69590	11/24/20 01:47	GM5C	ELLE

Client Sample ID: TB20308

Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-12
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	71355	12/01/20 13:43	NSK7	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Job ID: 410-21427-1
Project/Site: Bristol-Myers Squibb

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New York	NELAP	10670	04-01-21

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8260C		Groundwater	Chlorodifluoromethane
8260C		Groundwater	Cyclohexanone
8260C		Groundwater	n-Heptane
8260C		Water	Chlorodifluoromethane
8260C		Water	Cyclohexanone
8260C		Water	n-Heptane
8260C	5035	Soil	Chlorodifluoromethane
8260C	5035	Soil	Cyclohexanone
8260C	5035	Soil	Ethyl ether
8260C	5035	Soil	n-Heptane
8260C	5035	Soil	Tetrahydrofuran
8270D	3510C	Groundwater	Dicyclohexylamine
8270D	3510C	Groundwater	n,n'-Dimethylaniline
8270D	3510C	Groundwater	Triethylamine
8270D	3546	Soil	Dicyclohexylamine
8270D	3546	Soil	n,n'-Dimethylaniline
8270D	3546	Soil	Triethylamine
8315A	8315A Prep	Groundwater	Acetaldehyde
8315A	8315A Prep	Groundwater	Glutaraldehyde
8315A	8315A Prep	Soil	Acetaldehyde
8315A	8315A Prep	Soil	Glutaraldehyde
Moisture		Soil	Percent Moisture

Method Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	ELLE
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	ELLE
8315A	Carbonyl Compounds by HPLC	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	ELLE
3546	Microwave Extraction	SW846	ELLE
5030C	Purge and Trap	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE
8315A Prep	Extraction (Carbonyl Compounds)	SW846	ELLE
8315A Prep	Solid Phase Extraction (SPE)	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-21427-1	EB111820W	Groundwater	11/18/20 08:00	11/19/20 11:18	
410-21427-2	B55-PDI-SB-03	Groundwater	11/18/20 08:30	11/19/20 11:18	
410-21427-3	B55-PDI-SB-04	Groundwater	11/18/20 08:45	11/19/20 11:18	
410-21427-4	B55-PDI-SB-05	Groundwater	11/18/20 09:00	11/19/20 11:18	
410-21427-5	B55-PDI-SB-07	Groundwater	11/18/20 09:30	11/19/20 11:18	
410-21427-6	B55-PDI-SB-15	Groundwater	11/18/20 10:00	11/19/20 11:18	
410-21427-7	B55-PDI-SB-16	Groundwater	11/18/20 10:45	11/19/20 11:18	
410-21427-8	B55-PDI-SB-18	Groundwater	11/18/20 12:00	11/19/20 11:18	
410-21427-9	B55-PDI-SB-22 (5.2-6.2)	Soil	11/18/20 12:10	11/19/20 11:18	
410-21427-10	B55-PDI-SB-10 (9-10)	Soil	11/18/20 12:30	11/19/20 11:18	
410-21427-11	DUP111820	Soil	11/18/20 00:00	11/19/20 11:18	
410-21427-12	TB20308	Water	11/18/20 00:00	11/19/20 11:18	

Environmental Analysis Custody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-21427 Chain of Custody

ımental use only

COC #605303

Client Information		Matrix						Analysis Requested												For Lab Use Only
Client: Arcadis	Acct. #:	Soil / Sediment / Tissue	Water / Potable / Ground / NPDES / Surface	Other:	Total # of Containers	Preservation and Filtration Codes														FSC:
Project Name/#: Bristol-Myers Squibb	PWSID #:							H												SCR#:
Project Manager: William McClure	P.O. #:																			
Sampler: Joshua Miller	Quote #:																			
State where samples were collected: NY	For Compliance: Yes ☐ No ☒																			

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other:	Total # of Containers	Short-List Aldehydes 8315A	VOCs Water 8260C	SVOAs 8270D MINI	Short-List Aldehydes 8315A	SVOAs 8270D/E (Microwave)	VOCs Solid by 8260 C/D						Remarks
EB111820W	11/18/20	0800	X			X		6	X	X	X									
B55-PDI-SB-03		0830	X			X		6	X	X	X									
B55-PDI-SB-04		0845	X			X		6	X	X	X									
B55-PDI-SB-05		0900	X			X		6	X	X	X									
B55-PDI-SB-07		0930	X			X		6	X	X	X									
B55-PDI-SB-15		1000	X			X		6	X	X	X									
B55-PDI-SB-16		1045	X			X		6	X	X	X									
B55-PDI-SB-18		1200	X			X		6	X	X	X									
B55-PDI-SB-22 (5.2-6.2)		1210		X	X			14				X	X	X						Date Collected is 11/17/20
B55-PDI-SB-10 (9-10)	↓	1230		X	X			5				X	X	X						Date Collected is 11/12/20

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: Standard

E-mail address: William.McClure@arcadis.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	11/18/20	1300			
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
				11/19/20	1118

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx X Other _____

Temperature upon receipt 3.3 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • FOR HELP COMPLETING FORM CHECK OUT https://www.eurofinsus.com/coc

The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # _____ Group # _____ Sample # _____

COC #605305

Client Information

Client: Arcadis	Acct. #:
Project Name/#: Bristol-Myers Squibb	PWSID #:
Project Manager: William McLane	P.O. #:
Sampler: Joshua Miller	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☒

Matrix: Tissue ☐ Ground ☐ Surface ☐ Sediment ☐ Potable ☒ NPDES ☐ Soil ☒ Water Other: ____

Analysis Requested — Preservation and Filtration Codes

For Lab Use Only
FSC: _____
SCR#: _____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Water	Potable	Ground	Surface	Other	Total # of Containers	Short List Aldehydes 583.15A	SVOAs 8270 D/E (Microwave)	VOCs Solid by 8260 C/D	Short-List Aldehydes in Water 8315A	VOCs Water 8260C	SVOAs 8270 MINI	Remarks
DUP 111820	11/18/20	—		✓	X							5	X	X	X				Date Collected is 11/12/20
TB20308	11/12	LAB	PRE-DED				X					3			X				

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: Standard

E-mail address: William.McLane@arcadis.com

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	11/18/20	1300			
					11/14/20 1118

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx X Other _____

Temperature upon receipt 3.3 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • FOR HELP COMPLETING FORM CHECK OUT https://www.eurofinsus.com/coc
The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919

Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 410-21427-1

Login Number: 21427
List Number: 1
Creator: Reiff, Nicole L

List Source: Eurofins Lancaster Laboratories Env

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	True	

Data Validation Summary Reports

ARCADIS Design & Consultancy for natural and built assets

Bristol-Myers Squibb

Thompson Road Investigation

Data Usability Summary Report

Syracuse, NY

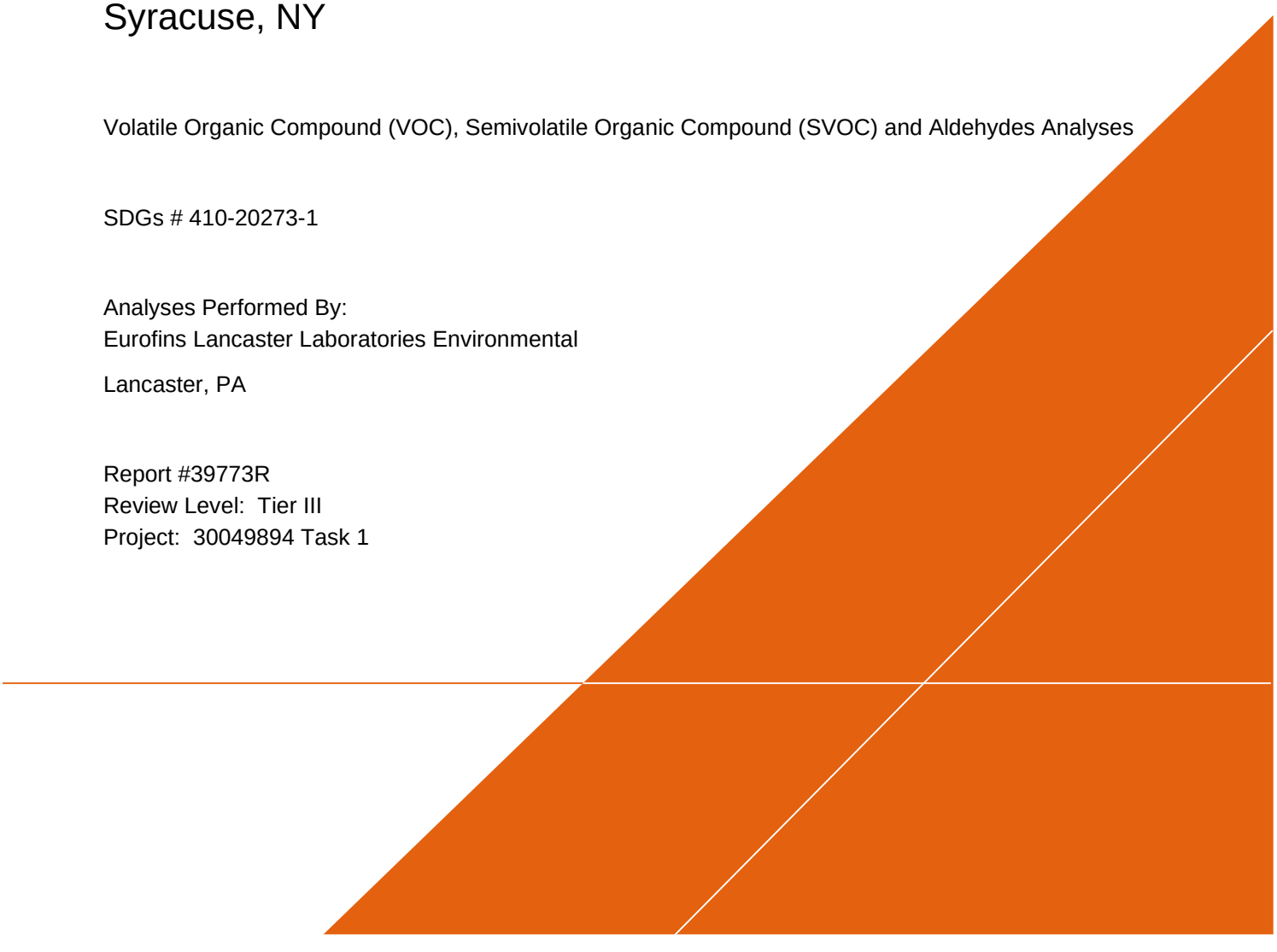
Volatile Organic Compound (VOC), Semivolatile Organic Compound (SVOC) and Aldehydes Analyses

SDGs # 410-20273-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental

Lancaster, PA

Report #39773R
Review Level: Tier III
Project: 30049894 Task 1



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # 410-20273-1 for samples collected in association with the with the Bristol-Myers Squibb Thompson Road Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PFAS	MET	ALD
410-20273-1	B55-PDI-SB-01 (8-10) 11102020	410-20273-1	Soil	11/10/2020	Date Collected is 11/9/20	X	X			X
	B55-PDI-SB-01 (16-16.9) 11102020	410-20273-2	Soil	11/10/2020	Date Collected is 11/9/20	X	X			X
	B55-PDI-SB-02 (10-12) 11102020	410-20273-3	Soil	11/10/2020		X	X			X

Notes: Aldehydes include Acetaldehyde, Formaldehyde and Glutaraldehyde.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

List of Acronyms

%D: Percent Difference

%R: Percent Recovery

AC: Acceptable

ALC/GLY: Alcohols/Glycols

BAL: Blank Action Level

CCV: Continuing Calibration Verification

CRDL: Contract Required Detection Limit

D: Dilution

EIS: Extractable Internal Standard

FB: Field Blank

FD: Field Duplicate

ALD: Aldehydes

GC/ECD: Gas Chromatograph/Electron Capture Detector

GC/MS: Gas Chromatograph/Mass spectrometer

HT: Holding Time

ICP: Inductively Coupled Plasma

ICS: Interference Control Sample

ICV: Initial Calibration Verification

ISTD: Internal Standards

LabDup: Laboratory Duplicate

LCS: Lab Control Sample

LCSD: Lab Control Sample Duplicate

LL: Lower Control Limit

MB: Method Blank

MDL: Method Detection Limit

MET: Metals

MS: Matrix Spike

MSD: Matrix Spike Duplicate

N/A: Not Applicable

NC: Not Compliant

List of Acronyms, Continued

PAH: Polyaromatic Hydrocarbon

PCB: Polychlorinated Biphenyl

PEST: Pesticide

PFAS: Per- and Polyfluoroalkyl Substances

QA: Quality Assurance

QC: Quality Control

RB: Rinse Blank

RL: Reporting Limit

RPD: Relative Percent Difference

RRF: Relative Response Factor

RSD: Relative Standard Deviation

RT: Retention Time

SDG: Sample Delivery Group

SerDil: Serial Dilution

SIM: Single Ion Monitoring

SOP: Standard Operating Procedure

SSTD: Surrogate Standards

SVOC: Semivolatile Organic Compound

TB: Trip Blank

TIC: Tentatively Identified Compound

TOC: Total Organic Carbon

TOTDIS: Total and Dissolved

UL: Upper Control Limit

USEPA: United States Environmental Protection Agency

VOC: Volatile Organic Compound

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW846 methods 8260C, 8270D and 8315A. Data were reviewed in accordance with EPA 540-R-2017-002, January 2017 (with reference to the historical USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999, as appropriate.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.

- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260C	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.
	Soil	48 hours from collection to extraction and 14 days from extraction to analysis	Cool to <6 °C.

Note:

s.u. Standard units

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. No qualification of the sample results was required.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
B55-PDI-SB-01 (8-10) 11102020 B55-PDI-SB-02 (10-12) 11102020	CCV %D	Chloromethane	-24.9%
		2-Butanone	-25.7%
		2-Nitropropane	101.8%
		Bromoform	21.3%
B55-PDI-SB-01 (16-16.9) 11102020	CCV %D	1,4-Dioxane	33.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
B55-PDI-SB-02 (10-12) 11102020	1,2-Dichloroethane-d4	AC
	4-Bromofluorobenzene	> UL
	Dibromofluoromethane	AC
	Toluene-d8	AC

Notes:

UL Upper control limit

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J
< LL but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Non-detect	UJ[1]
	Detect	J[1]

6. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS/MSD analysis was not performed on a sample within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
B55-PDI-SB-01 (8-10) 11102020 B55-PDI-SB-02 (10-12) 11102020	Bromoform	>UL	>UL
	2-Nitropropane	>UL	>UL

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with this SDG.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
B55-PDI-SB-01 (8-10) 11102020	Methylcyclohexane	-	83	83 D
	1,2,4-Trimethylbenzene	-	240	240 D
	n-Heptane	-	110	110 D
B55-PDI-SB-02 (10-12) 11102020	1,2,4-Trimethylbenzene	-	34	34 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

Tentatively identified compounds (TICs) were identified in all sample locations associated with this SDG. VOC analysis requires that TICs be qualified as estimated (JN).

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)		X	X		
Laboratory Control Sample Duplicate(LCSD)		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)					X
Matrix Spike Duplicate(MSD)					X
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)					X
Surrogate Spike Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	

VOCs: SW-846 8260C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

SEMI-VOLATILE ORGANIC COMPOUND (SVOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270D	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
B55-PDI-SB-01 (16-16.9) 11102020	TIC: 2,5-Dimethyl Furan	Detected sample results less than 5 times blank result	R

Note:

RL Reporting limit

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS/MSD analysis was not performed on a sample within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
B55-PDI-SB-01 (8-10) 11102020 B55-PDI-SB-01 (16-16.9) 11102020 B55-PDI-SB-02 (10-12) 11102020	Triethylamine	<LL but >10%	<LL but >10%

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

Sample locations associated with LCS/LCSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
B55-PDI-SB-01 (8-10) 11102020 B55-PDI-SB-01 (16-16.9) 11102020 B55-PDI-SB-02 (10-12) 11102020	Triethylamine

The criteria used to evaluate the RPD between the LCS/LCSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with this SDG.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
B55-PDI-SB-01 (8-10) 11102020	2-Methylnaphthalene	-	6.4	6.4 D
B55-PDI-SB-01 (16-16.9) 11102020	Dicyclohexylamine	-	4.9	4.9 D
B55-PDI-SB-02 (10-12) 11102020	Dicyclohexylamine	-	8.6	8.6 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

Tentatively identified compounds (TICs) were identified in all sample locations associated with this SDG. SVOC analysis requires that TICs be qualified as estimated (JN).

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270D and 8270D-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
D. Method blanks		X		X	
E. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X	X		
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
F. Reconstructed ion chromatograms		X		X	
G. Quantitation Reports		X		X	
H. RT of sample compounds within the established RT windows		X		X	

SVOCs: SW-846 8270D and 8270D-SIM		Reported		Performance Acceptable		Not Required
		No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)						
I.	Quantitation transcriptions/calculations		X		X	
J.	Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

ALDEHYDES ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8315A	Water	3 days until extraction; 3 days from extraction to analysis	Cool to <6 °C
	Soil	14 days until extraction; 3 days from extraction to analysis	Cool to <6 °C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Holding Time	Criteria
B55-PDI-SB-01 (8-10) 11102020 B55-PDI-SB-01 (16-16.9) 11102020 B55-PDI-SB-02 (10-12) 11102020	Analysis completed in 4 Days	3 Days

Sample results associated with sample locations analyzed by analytical method SW-846 8315A were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% is allowed or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires that the surrogate compound exhibits recovery within the laboratory-established acceptance limits.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
B55-PDI-SB-01 (16-16.9)	Butyraldehyde	>UL

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J
< LL but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
B55-PDI-SB-01 (8-10) 11102020	Acetaldehyde	AC	>UL

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate

sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with this SDG.

9. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows.

All identified compounds met the specified criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL GC

Aldehyde: SW846 8315A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/FID)					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)					X
Surrogate Spike Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

SAMPLE COMPLIANCE REPORT

Sample Delivery Group (SDG)	Sampling Date	Protocol	Sample ID	Matrix	Compliancy[1]					Noncompliance
					VOC	SVOC	ALD	PFAS	MET	
410-20273-1	11/10/2020	SW846	B55-PDI-SB-01 (8-10) 11102020	Soil	No	No	No	-	-	VOC: CCV %D, Dilution SVOC: LCS/LCSD %R/RPD, Dilution ALD: HT, MS/MSD %R
	11/10/2020	SW846	B55-PDI-SB-01 (16-16.9) 11102020	Soil	Yes	No	No	-	-	SVOC: LCS/LCSD %R/RPD, Dilution ALD: HT
	11/10/2020	SW846	B55-PDI-SB-02 (10-12) 11102020	Soil	No	No	No	-	-	VOC: CCV %D, SSTD %R, Dilution SVOC: LCS/LCSD %R/RPD ALD: HT

Note:

1 Samples which are compliant with no added validation qualifiers are listed as "yes". Samples which are non-compliant or which have added qualifiers are listed as "no". A "no" designation does not necessarily indicate that the data have been rejected or are otherwise unusable.

VALIDATION PERFORMED BY: Jeffrey L. Davin

SIGNATURE: 

DATE: January 20, 2021

PEER REVIEW: Dennis K. Capria

DATE: January 21, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Environmental Analysis R ustody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-20273 Chain of Custody

ntal use only _____

COC # 616402

Client Information

Client: Arcadis	Acct. #:
Project Name/#: Bristol-Myers Squibb	PWSID #:
Project Manager: William McCune	P.O. #:
Sampler: Joshua Miller	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☐

Matrix: Soil ☒ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: ☐

Analysis Requested — Preservation and Filtration Codes

For Lab Use Only
FSC: _____
SCR#: _____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	Short-list Alkhydes 5-7315A	SVOA 8270D/E (Microwave)	VOCs-Soil by 8260 C/D
B55-PDI-SB-01 (8-10)	11/10/20	1035		X	5	X	X	X
B55-PDI-SB-01 (16-16.7)	11/10/20	1030		X	5	X	X	X
B55-PDI-SB-02 (10-12)	11/10/20	0955		X	5	X	X	X

Remarks

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: Standard

E-mail address: William.McCune@arcadis.com

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	11/10/20	1500			
				11/11/20	1100

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx ✓ Other _____

Temperature upon receipt 1.2 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • FOR HELP COMPLETING FORM CHECK OUT https://www.eurofinsus.com/coc
The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919

JR

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*1	LCS/LCSD RPD exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated

Client Sample ID: B55-PDI-SB-01 (8-10)
Lab Sample ID: 410-20273-1

Date Collected: 11/10/20 10:35 Date Collected is 11/9/20
Date Received: 11/11/20 11:00 Date Recorded Here is the Sample Shipment Date
Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**15.7**		1.0	1.0	%			11/12/20 21:26	1

Client Sample ID: B55-PDI-SB-01 (8-10)
Lab Sample ID: 410-20273-1

Date Collected: 11/10/20 10:35 Date Collected is 11/9/20
Date Received: 11/11/20 11:00 Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Percent Solids: 84.3

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
trans-1,3-Dichloropropene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Ethylbenzene	**17**		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Styrene	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,4-Dichlorobenzene	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2-Dibromoethane	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2-Dichloroethane	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
4-Methyl-2-pentanone	ND		2.2	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Toluene	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Chlorobenzene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Cyclohexane	**37**		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2,4-Trichlorobenzene	ND		2.2	1.1	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,4-Dioxane	ND		56	8.2	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Dibromochloromethane	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Tetrachloroethene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
cis-1,2-Dichloroethene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
trans-1,2-Dichloroethene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Methyl tertiary butyl ether	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
m&p-Xylene	**40**		1.1	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,3,5-Trimethylbenzene	**55**		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,3-Dichlorobenzene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Carbon tetrachloride	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
2-Hexanone	ND		2.2	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Acetone	ND		4.4	1.3	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Chloroform	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Benzene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,1,1-Trichloroethane	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Bromomethane	ND		1.1	0.16	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Chloromethane	ND	J	1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Bromochloromethane	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Chloroethane	ND		1.1	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Vinyl chloride	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Methylene Chloride	ND		1.1	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Carbon disulfide	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Bromoform	ND	*	2.2	1.1	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Bromodichloromethane	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,1-Dichloroethane	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,1-Dichloroethene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Trichlorofluoromethane	ND		1.1	0.16	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Dichlorodifluoromethane	ND		1.1	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Freon 113	ND		2.2	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2-Dichloropropane	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200

Client Sample ID: B55-PDI-SB-01 (8-10)
Lab Sample ID: 410-20273-1
Date Collected: 11/10/20 10:35 Date Collected is 11/9/20
Date Received: 11/11/20 11:00 Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Percent Solids: 84.3

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone	ND	J	2.2	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,1,2-Trichloroethane	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
2-Nitropropane	~~ND~~ *	R	2.2	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Trichloroethene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Methyl acetate	ND		1.1	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,1,2,2-Tetrachloroethane	ND		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2,3-Trichlorobenzene	ND		2.2	1.1	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
o-Xylene	**9.3**		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2-Dichlorobenzene	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
1,2-Dibromo-3-Chloropropane	ND		1.1	0.11	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Acetonitrile	ND		22	5.6	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Isopropylbenzene	**10**		1.1	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Chlorodifluoromethane	ND		2.2	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Cyclohexanone	ND		56	5.6	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Ethyl acetate	ND		1.1	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Ethyl ether	ND		1.1	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Isobutyl alcohol	ND		56	8.4	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Naphthalene	**13**		1.1	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
n-Butanol	ND		56	12	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
n-Butylbenzene	**11**		1.8	0.67	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
p-Isopropyltoluene	**2.2**		1.1	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
sec-Butylbenzene	**3.3**		1.1	0.44	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
t-Butyl alcohol	ND		22	3.3	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
tert-Butylbenzene	ND		1.1	0.18	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Tetrahydrofuran	ND		1.8	0.22	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200
Xylenes, Total	**49**		2.2	0.31	mg/Kg	☼	11/12/20 22:07	11/23/20 01:19	200

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Hexane, 3-methyl-	*26*	*J N*	*mg/Kg*	☼	*7.31*	*589-34-4*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Heptane, 2-methyl-	*34*	*J N*	*mg/Kg*	☼	*9.47*	*592-27-8*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Heptane, 3-methyl-	*28*	*J N*	*mg/Kg*	☼	*9.64*	*589-81-1*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Octane	*30*	*J N*	*mg/Kg*	☼	*10.12*	*111-65-9*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Unknown	*31*	*J N*	*mg/Kg*	☼	*11.12*		*11/12/20 22:07*	*11/23/20 01:19*	*200*
Benzene, 1-ethyl-3-methyl-	*77*	*J N*	*mg/Kg*	☼	*12.56*	*620-14-4*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Benzene, 1-ethyl-4-methyl-	*36*	*J N*	*mg/Kg*	☼	*12.60*	*622-96-8*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Benzene, 1-ethyl-2-methyl-	*34*	*J N*	*mg/Kg*	☼	*12.78*	*611-14-3*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Unknown	*34*	*J N*	*mg/Kg*	☼	*13.37*		*11/12/20 22:07*	*11/23/20 01:19*	*200*
Benzene, 2-ethenyl-1,4-dimethyl-	*31*	*J N*	*mg/Kg*	☼	*14.30*	*2039-89-6*	*11/12/20 22:07*	*11/23/20 01:19*	*200*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
4-Bromofluorobenzene (Surr)	*126*		*50 - 131*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Dibromofluoromethane (Surr)	*98*		*50 - 141*	*11/12/20 22:07*	*11/23/20 01:19*	*200*
Toluene-d8 (Surr)	*126*		*52 - 141*	*11/12/20 22:07*	*11/23/20 01:19*	*200*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	**83**	D	11	1.3	mg/Kg	☼	11/12/20 22:07	11/23/20 01:40	2000
1,2,4-Trimethylbenzene	**240**	D	11	1.1	mg/Kg	☼	11/12/20 22:07	11/23/20 01:40	2000
n-Heptane	**110**	D	18	6.7	mg/Kg	☼	11/12/20 22:07	11/23/20 01:40	2000

Client Sample ID: B55-PDI-SB-01 (8-10)

Lab Sample ID: 410-20273-1

Date Collected: 11/10/20 10:35 Date Collected is 11/9/20
Date Received: 11/11/20 11:00 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.3

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*54 - 135*	*11/12/20 22:07*	*11/23/20 01:40*	*2000*
4-Bromofluorobenzene (Surr)	*130*		*50 - 131*	*11/12/20 22:07*	*11/23/20 01:40*	*2000*
Dibromofluoromethane (Surr)	*96*		*50 - 141*	*11/12/20 22:07*	*11/23/20 01:40*	*2000*
Toluene-d8 (Surr)	*120*		*52 - 141*	*11/12/20 22:07*	*11/23/20 01:40*	*2000*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	**0.072**		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
1,2,4,5-Tetrachlorobenzene	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,2'-oxybis[1-chloropropane]	ND		0.051	0.024	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4,5-Trichlorophenol	ND		0.079	0.035	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4,6-Trichlorophenol	ND		0.067	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4-Dichlorophenol	ND		0.051	0.024	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4-Dimethylphenol	ND		0.079	0.035	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4-Dinitrophenol	ND		1.2	0.39	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,4-Dinitrotoluene	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2,6-Dinitrotoluene	ND		0.059	0.028	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2-Chloronaphthalene	ND		0.039	0.0079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2-Chlorophenol	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2-Methylphenol	ND		0.079	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2-Nitroaniline	ND		0.059	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
2-Nitrophenol	ND		0.067	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
3,3'-Dichlorobenzidine	ND		0.39	0.12	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
3-Nitroaniline	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4,6-Dinitro-2-methylphenol	ND		0.59	0.28	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Bromophenyl-phenylether	ND		0.059	0.028	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Chloro-3-methylphenol	ND		0.059	0.028	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
3,4-Methylphenol	ND		0.059	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Nitroaniline	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Nitrophenol	ND		0.59	0.20	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Acenaphthene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Acenaphthylene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Acetophenone	ND		0.059	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Anthracene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Atrazine	ND		0.51	0.24	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzaldehyde	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzo[a]anthracene	ND		0.020	0.0079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzo[a]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzo[b]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzo[g,h,i]perylene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzo[k]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Bis(2-chloroethoxy)methane	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Bis(2-chloroethyl)ether	ND		0.059	0.028	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Butylbenzylphthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Caprolactam	ND		0.20	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Carbazole	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Chrysene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Di-n-butyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1

Client Sample ID: B55-PDI-SB-01 (8-10)
Lab Sample ID: 410-20273-1

Date Collected: 11/10/20 10:35 Date Collected is 11/9/20
Date Received: 11/11/20 11:00 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.3

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Di-n-octyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Dibenz(a,h)anthracene	ND		0.020	0.0079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Dibenzofuran	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Diethyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Dimethyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Fluoranthene	**0.0069**	**J**	0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Chloroaniline	ND		0.20	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Fluorene	**0.033**		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
4-Chlorophenyl-phenyl ether	ND		0.051	0.024	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Hexachlorobenzene	ND		0.020	0.0079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Hexachlorobutadiene	ND		0.090	0.043	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Hexachlorocyclopentadiene	ND		0.59	0.24	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Hexachloroethane	ND		0.20	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Isophorone	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
N-Nitrosodi-n-propylamine	ND		0.059	0.028	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
N-Nitrosodiphenylamine	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Naphthalene	**2.9**		0.020	0.0079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Nitrobenzene	ND		0.079	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Phenanthrene	**0.059**		0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Aniline	ND		0.59	0.20	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Phenol	ND		0.043	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Pyrene	**0.011**	**J**	0.020	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Pentachlorophenol	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Benzyl alcohol	ND		0.59	0.20	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Dicyclohexylamine	**1.5**	**J**	2.4	0.79	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
n,n'-Dimethylaniline	ND		0.20	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Pyridine	ND		0.20	0.079	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
Triethylamine	ND	~~* **~~ J	5.9	2.0	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1
1,4-Dioxane	ND		0.39	0.12	mg/Kg	☼	11/16/20 00:40	11/24/20 13:49	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*76*	*J N*	*mg/Kg*	☼	*3.46*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*12*	*J N*	*mg/Kg*	☼	*3.50*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*42*	*J N*	*mg/Kg*	☼	*3.58*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*50*	*J N*	*mg/Kg*	☼	*4.03*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1-ethyl-4-methyl-	*9.4*	*J N*	*mg/Kg*	☼	*5.11*	*622-96-8*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1-ethyl-3-methyl-	*5.1*	*J N*	*mg/Kg*	☼	*5.14*	*620-14-4*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1,2,3-trimethyl-	*4.8*	*J N*	*mg/Kg*	☼	*5.18*	*526-73-8*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1-ethyl-2-methyl-	*3.5*	*J N*	*mg/Kg*	☼	*5.25*	*611-14-3*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Unknown	*18*	*J N*	*mg/Kg*	☼	*5.40*		*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1,3,5-trimethyl-	*5.4*	*J N*	*mg/Kg*	☼	*5.61*	*108-67-8*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1-methyl-3-propyl-	*4.3*	*J N*	*mg/Kg*	☼	*5.83*	*1074-43-7*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1,4-diethyl-	*8.2*	*J N*	*mg/Kg*	☼	*5.87*	*105-05-5*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Indan, 1-methyl-	*3.4*	*J N*	*mg/Kg*	☼	*6.10*	*767-58-8*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
1,2,4-Trithiolane	*7.5*	*J N*	*mg/Kg*	☼	*6.22*	*289-16-7*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1,2,3,5-tetramethyl-	*3.3*	*J N*	*mg/Kg*	☼	*6.30*	*527-53-7*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
Benzene, 1,2,4,5-tetramethyl-	*5.4*	*J N*	*mg/Kg*	☼	*6.33*	*95-93-2*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
1H-Indene, 2,3-dihydro-4-methyl-	*4.9*	*J N*	*mg/Kg*	☼	*6.47*	*824-22-6*	*11/16/20 00:40*	*11/24/20 13:49*	*1*
2,4-Dimethylstyrene	*11*	*J N*	*mg/Kg*	☼	*6.53*	*2234-20-0*	*11/16/20 00:40*	*11/24/20 13:49*	*1*

Client Sample ID: B55-PDI-SB-01 (8-10)
Lab Sample ID: 410-20273-1

Date Collected: 11/10/20 10:35 Date Collected is 11/9/20
Date Received: 11/11/20 11:00 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.3

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	3.7	T J N	mg/Kg	☼	6.58		11/16/20 00:40	11/24/20 13:49	1
Unknown	3.3	T J N	mg/Kg	☼	6.63		11/16/20 00:40	11/24/20 13:49	1
Unknown	6.3	T J N	mg/Kg	☼	6.81		11/16/20 00:40	11/24/20 13:49	1
1H-Indene, 2,3-dihydro-4,7-dimethyl-	3.1	T J N	mg/Kg	☼	7.17	6682-71-9	11/16/20 00:40	11/24/20 13:49	1
Unknown	2.9	T J N	mg/Kg	☼	7.24		11/16/20 00:40	11/24/20 13:49	1
Tridecane	3.5	T J N	mg/Kg	☼	7.40	629-50-5	11/16/20 00:40	11/24/20 13:49	1
Naphthalene, 1-methyl-	3.5	T J N	mg/Kg	☼	7.57	90-12-0	11/16/20 00:40	11/24/20 13:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	93		45 - 108	11/16/20 00:40	11/24/20 13:49	1
Nitrobenzene-d5 (Surr)	59		32 - 97	11/16/20 00:40	11/24/20 13:49	1
2-Fluorophenol (Surr)	76		26 - 96	11/16/20 00:40	11/24/20 13:49	1
2-Fluorobiphenyl (Surr)	85		39 - 100	11/16/20 00:40	11/24/20 13:49	1
2,4,6-Tribromophenol (Surr)	19		13 - 121	11/16/20 00:40	11/24/20 13:49	1
Phenol-d5 (Surr)	81		27 - 104	11/16/20 00:40	11/24/20 13:49	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	6.4	D	0.20	0.020	mg/Kg	☼	11/16/20 00:40	11/24/20 17:22	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	84		45 - 108	11/16/20 00:40	11/24/20 17:22	5
Nitrobenzene-d5 (Surr)	64		32 - 97	11/16/20 00:40	11/24/20 17:22	5
2-Fluorophenol (Surr)	76		26 - 96	11/16/20 00:40	11/24/20 17:22	5
2-Fluorobiphenyl (Surr)	74		39 - 100	11/16/20 00:40	11/24/20 17:22	5
2,4,6-Tribromophenol (Surr)	16		13 - 121	11/16/20 00:40	11/24/20 17:22	5
Phenol-d5 (Surr)	79		27 - 104	11/16/20 00:40	11/24/20 17:22	5

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	~~F1~~ J	59	30	ug/Kg	☼	11/14/20 08:33	11/18/20 21:44	1
Formaldehyde	170	J	89	30	ug/Kg	☼	11/14/20 08:33	11/18/20 21:44	1
Glutaraldehyde	ND	J	59	30	ug/Kg	☼	11/14/20 08:33	11/18/20 21:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	133		77 - 133	11/14/20 08:33	11/18/20 21:44	1

Client Sample ID: B55-PDI-SB-01 (16-16.9)
Lab Sample ID: 410-20273-2

Date Collected: 11/10/20 10:30 Date Collected is 11/9/20
Date Received: 11/11/20 11:00 Date Recorded Here is the Sample Shipment Date

Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.2		1.0	1.0	%			11/12/20 21:26	1

Client Sample ID: B55-PDI-SB-01 (16-16.9)
Lab Sample ID: 410-20273-2

Date Collected: 11/10/20 10:30 Date Collected is 11/9/20
Date Received: 11/11/20 11:00 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 87.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,1,2,2-Tetrachloroethane	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,1,2-Trichloroethane	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,1-Dichloroethane	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,1-Dichloroethene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2,3-Trichlorobenzene	ND		0.0082	0.0041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2,4-Trichlorobenzene	ND		0.0082	0.0041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2,4-Trimethylbenzene	**0.0076**		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2-Dibromo-3-Chloropropane	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2-Dibromoethane	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2-Dichlorobenzene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2-Dichloroethane	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,2-Dichloropropane	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,3,5-Trimethylbenzene	**0.0022**	**J**	0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,3-Dichlorobenzene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,4-Dichlorobenzene	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
1,4-Dioxane	ND		0.20	0.030	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
2-Butanone	ND		0.0082	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
2-Hexanone	ND		0.0082	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
2-Nitropropane	ND		0.0082	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
4-Methyl-2-pentanone	ND		0.0082	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Acetone	**0.038**		0.016	0.0049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Acetonitrile	ND		0.082	0.020	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Benzene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Bromochloromethane	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Bromodichloromethane	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Bromoform	ND		0.0082	0.0041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Bromomethane	ND		0.0041	0.00057	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Carbon disulfide	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Carbon tetrachloride	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Chlorobenzene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Chlorodifluoromethane	ND		0.0082	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Chloroethane	ND		0.0041	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Chloroform	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Chloromethane	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
cis-1,2-Dichloroethene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
cis-1,3-Dichloropropene	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Cyclohexane	**0.0056**		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Cyclohexanone	ND		0.20	0.020	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Dibromochloromethane	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Dichlorodifluoromethane	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Ethyl acetate	ND		0.0041	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Ethyl ether	ND		0.0041	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Ethylbenzene	**0.00053**	**J**	0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Freon 113	ND		0.0082	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Isobutyl alcohol	ND		0.20	0.031	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Isopropylbenzene	**0.00033**	**J**	0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
m&p-Xylene	**0.0015**	**J**	0.0041	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Methyl acetate	ND		0.0041	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1

Client Sample ID: B55-PDI-SB-01 (16-16.9)

Lab Sample ID: 410-20273-2

Date Collected: 11/10/20 10:30
Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date
Matrix: Soil

Date Received: 11/11/20 11:00
Percent Solids: 87.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Methylcyclohexane	**0.0029**	**J**	0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Methylene Chloride	ND		0.0041	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Naphthalene	ND		0.0041	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
n-Butanol	ND		0.20	0.046	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
n-Butylbenzene	ND		0.0065	0.0024	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
n-Heptane	ND		0.0065	0.0024	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
o-Xylene	**0.00036**	**J**	0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
p-Isopropyltoluene	ND		0.0041	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
sec-Butylbenzene	ND		0.0041	0.0016	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Styrene	ND		0.0041	0.00033	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
t-Butyl alcohol	ND		0.082	0.012	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
tert-Butylbenzene	ND		0.0041	0.00065	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Tetrachloroethene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Tetrahydrofuran	ND		0.0065	0.00082	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Toluene	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
trans-1,2-Dichloroethene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
trans-1,3-Dichloropropene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Trichloroethene	ND		0.0041	0.00041	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Trichlorofluoromethane	ND		0.0041	0.00057	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Vinyl chloride	ND		0.0041	0.00049	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1
Xylenes, Total	**0.0019**	**J**	0.0082	0.0011	mg/Kg	☼	11/12/20 22:24	11/24/20 14:27	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.0060*	*J N*	*mg/Kg*	☼	*2.00*		*11/12/20 22:24*	*11/24/20 14:27*	*1*
Pentane	*0.0090*	*J N*	*mg/Kg*	☼	*2.20*	*109-66-0*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Pentane, 3-methyl-	*0.0061*	*J N*	*mg/Kg*	☼	*3.29*	*96-14-0*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Cyclopentane, methyl-	*0.0060*	*J N*	*mg/Kg*	☼	*4.15*	*96-37-7*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Hexane, 2-methyl-	*0.0048*	*J N*	*mg/Kg*	☼	*4.76*	*591-76-4*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Hexane, 3-methyl-	*0.0041*	*J N*	*mg/Kg*	☼	*4.94*	*589-34-4*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Benzene, 1-ethyl-2-methyl-	*0.0069*	*J N*	*mg/Kg*	☼	*9.69*	*611-14-3*	*11/12/20 22:24*	*11/24/20 14:27*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*54 - 135*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
4-Bromofluorobenzene (Surr)	*94*		*50 - 131*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Dibromofluoromethane (Surr)	*97*		*50 - 141*	*11/12/20 22:24*	*11/24/20 14:27*	*1*
Toluene-d8 (Surr)	*103*		*52 - 141*	*11/12/20 22:24*	*11/24/20 14:27*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
1,2,4,5-Tetrachlorobenzene	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,2'-oxybis[1-chloropropane]	ND		0.049	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,3,4,6-Tetrachlorophenol	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4,5-Trichlorophenol	ND		0.075	0.034	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4,6-Trichlorophenol	ND		0.064	0.030	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4-Dichlorophenol	ND		0.049	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4-Dimethylphenol	ND		0.075	0.034	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4-Dinitrophenol	ND		1.1	0.38	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2,4-Dinitrotoluene	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1

Client Sample ID: B55-PDI-SB-01 (16-16.9)
Lab Sample ID: 410-20273-2

Date Collected: 11/10/20 10:30 Date Collected is 11/9/20
Date Received: 11/11/20 11:00 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 87.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,6-Dinitrotoluene	ND		0.056	0.026	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Chloronaphthalene	ND		0.038	0.0075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Chlorophenol	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Methylnaphthalene	**0.013**	**J**	0.038	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Methylphenol	ND		0.075	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Nitroaniline	ND		0.056	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
2-Nitrophenol	ND		0.064	0.030	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
3,3'-Dichlorobenzidine	ND		0.38	0.11	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
3-Nitroaniline	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4,6-Dinitro-2-methylphenol	ND		0.56	0.26	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Bromophenyl-phenylether	ND		0.056	0.026	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Chloro-3-methylphenol	ND		0.056	0.026	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
3,4-Methylphenol	ND		0.056	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Nitroaniline	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Nitrophenol	ND		0.56	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Acenaphthene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Acenaphthylene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Acetophenone	ND		0.056	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Anthracene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Atrazine	ND		0.49	0.23	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzaldehyde	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzo[a]anthracene	ND		0.019	0.0075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzo[a]pyrene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzo[b]fluoranthene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzo[g,h,i]perylene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzo[k]fluoranthene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Bis(2-chloroethoxy)methane	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Bis(2-chloroethyl)ether	ND		0.056	0.026	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Bis(2-ethylhexyl) phthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Butylbenzylphthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Caprolactam	ND		0.19	0.038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Carbazole	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Chrysene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Di-n-butyl phthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Di-n-octyl phthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Dibenz(a,h)anthracene	ND		0.019	0.0075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Dibenzofuran	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Diethyl phthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Dimethyl phthalate	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Fluoranthene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Chloroaniline	ND		0.19	0.038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Fluorene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
4-Chlorophenyl-phenyl ether	ND		0.049	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Hexachlorobenzene	ND		0.019	0.0075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Hexachlorobutadiene	ND		0.087	0.041	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Hexachlorocyclopentadiene	ND		0.56	0.23	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Hexachloroethane	ND		0.19	0.038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Indeno[1,2,3-cd]pyrene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Isophorone	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1

Client Sample ID: B55-PDI-SB-01 (16-16.9)

Date Collected: 11/10/20 10:30
Date Received: 11/11/20 11:00

Date Collected is 11/9/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20273-2

Matrix: Soil
Percent Solids: 87.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		0.056	0.026	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
N-Nitrosodiphenylamine	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Naphthalene	**0.033**		0.019	0.0075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Nitrobenzene	ND		0.075	0.030	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Phenanthrene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Aniline	ND		0.56	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Phenol	ND		0.041	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Pyrene	ND		0.019	0.0038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Pentachlorophenol	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Benzyl alcohol	ND		0.56	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
n,n'-Dimethylaniline	ND		0.19	0.038	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Pyridine	ND		0.19	0.075	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
Triethylamine	~~ND~~	~~*-1~~ J	5.6	1.9	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1
1,4-Dioxane	ND		0.38	0.11	mg/Kg	☼	11/16/20 00:40	11/24/20 14:14	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.41*	*J N*	*mg/Kg*	☼	*2.07*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
~~Furan, 2,5-dimethyl-~~	*~~0.17~~*	*~~J N B~~ R*	*mg/Kg*	☼	*2.28*	*625-86-5*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*4.1*	*J N*	*mg/Kg*	☼	*3.27*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
3-Penten-2-one, 4-methyl-	*0.17*	*J N*	*mg/Kg*	☼	*3.41*	*141-79-7*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*21*	*J B N*	*mg/Kg*	☼	*3.93*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
2-Cyclohexen-1-one	*0.20*	*J N*	*mg/Kg*	☼	*4.82*	*930-68-7*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.19*	*J N*	*mg/Kg*	☼	*5.03*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.55*	*J N*	*mg/Kg*	☼	*5.45*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.17*	*J N*	*mg/Kg*	☼	*6.53*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.32*	*J N*	*mg/Kg*	☼	*7.11*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.28*	*J N*	*mg/Kg*	☼	*9.39*		*11/16/20 00:40*	*11/24/20 14:14*	*1*
Unknown	*0.99*	*J N*	*mg/Kg*	☼	*10.09*		*11/16/20 00:40*	*11/24/20 14:14*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*98*		*45 - 108*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
Nitrobenzene-d5 (Surr)	*66*		*32 - 97*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
2-Fluorophenol (Surr)	*77*		*26 - 96*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
2-Fluorobiphenyl (Surr)	*81*		*39 - 100*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
2,4,6-Tribromophenol (Surr)	*51*		*13 - 121*	*11/16/20 00:40*	*11/24/20 14:14*	*1*
Phenol-d5 (Surr)	*82*		*27 - 104*	*11/16/20 00:40*	*11/24/20 14:14*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**4.9**	D	4.5	1.5	mg/Kg	☼	11/16/20 00:40	11/24/20 17:45	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*87*		*45 - 108*	*11/16/20 00:40*	*11/24/20 17:45*	*2*
Nitrobenzene-d5 (Surr)	*64*		*32 - 97*	*11/16/20 00:40*	*11/24/20 17:45*	*2*
2-Fluorophenol (Surr)	*72*		*26 - 96*	*11/16/20 00:40*	*11/24/20 17:45*	*2*
2-Fluorobiphenyl (Surr)	*73*		*39 - 100*	*11/16/20 00:40*	*11/24/20 17:45*	*2*
2,4,6-Tribromophenol (Surr)	*42*		*13 - 121*	*11/16/20 00:40*	*11/24/20 17:45*	*2*
Phenol-d5 (Surr)	*76*		*27 - 104*	*11/16/20 00:40*	*11/24/20 17:45*	*2*

Client Sample ID: B55-PDI-SB-01 (16-16.9)
Lab Sample ID: 410-20273-2

Date Collected: 11/10/20 10:30 Date Collected is 11/9/20
Date Received: 11/11/20 11:00 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 87.8

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	J	57	28	ug/Kg	☼	11/14/20 08:33	11/18/20 21:56	1
Formaldehyde	**100**	J	85	28	ug/Kg	☼	11/14/20 08:33	11/18/20 21:56	1
Glutaraldehyde	ND	J	57	28	ug/Kg	☼	11/14/20 08:33	11/18/20 21:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*136*	*X*	*77 - 133*	*11/14/20 08:33*	*11/18/20 21:56*	*1*

Client Sample ID: B55-PDI-SB-02 (10-12)
Lab Sample ID: 410-20273-3

Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**14.8**		1.0	1.0	%			11/12/20 21:26	1

Client Sample ID: B55-PDI-SB-02 (10-12)
Lab Sample ID: 410-20273-3

Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Matrix: Soil
Percent Solids: 85.2

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
trans-1,3-Dichloropropene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Ethylbenzene	**0.35**	J	0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Styrene	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,4-Dichlorobenzene	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2-Dibromoethane	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2-Dichloroethane	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
4-Methyl-2-pentanone	ND		0.64	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Methylcyclohexane	**2.3**	J	0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Toluene	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Chlorobenzene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Cyclohexane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2,4-Trichlorobenzene	ND		0.64	0.32	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,4-Dioxane	ND		16	2.4	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Dibromochloromethane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Tetrachloroethene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
cis-1,2-Dichloroethene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
trans-1,2-Dichloroethene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Methyl tertiary butyl ether	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
m&p-Xylene	**1.3**	J	0.32	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,3,5-Trimethylbenzene	**8.2**	J	0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,3-Dichlorobenzene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Carbon tetrachloride	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
2-Hexanone	ND		0.64	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Acetone	ND		1.3	0.38	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Chloroform	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Benzene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,1,1-Trichloroethane	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Bromomethane	ND		0.32	0.045	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Chloromethane	ND	J	0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50

Client Sample ID: B55-PDI-SB-02 (10-12)

Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3

Matrix: Soil
Percent Solids: 85.2

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromochloromethane	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Chloroethane	ND		0.32	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Vinyl chloride	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Methylene Chloride	ND		0.32	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Carbon disulfide	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Bromoform	ND	*	0.64	0.32	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Bromodichloromethane	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,1-Dichloroethane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,1-Dichloroethene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Trichlorofluoromethane	ND		0.32	0.045	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Dichlorodifluoromethane	ND		0.32	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Freon 113	ND		0.64	0.038	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2-Dichloropropane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
2-Butanone	ND	J	0.64	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,1,2-Trichloroethane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
2-Nitropropane	ND	* R	0.64	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Trichloroethene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Methyl acetate	ND		0.32	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,1,2,2-Tetrachloroethane	ND		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2,3-Trichlorobenzene	ND		0.64	0.32	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
o-Xylene	**0.22**	**J**	0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2-Dichlorobenzene	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
1,2-Dibromo-3-Chloropropane	ND		0.32	0.032	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Acetonitrile	ND		6.4	1.6	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Isopropylbenzene	**1.4**		0.32	0.025	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Chlorodifluoromethane	ND		0.64	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Cyclohexanone	ND		16	1.6	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Ethyl acetate	ND		0.32	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Ethyl ether	ND		0.32	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Isobutyl alcohol	ND		16	2.4	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Naphthalene	**0.57**	**J**	0.32	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
n-Butanol	ND		16	3.6	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
n-Butylbenzene	**2.5**	**J**	0.51	0.19	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
n-Heptane	**0.78**		0.51	0.19	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
p-Isopropyltoluene	**0.47**		0.32	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
sec-Butylbenzene	**0.75**		0.32	0.13	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
t-Butyl alcohol	ND		6.4	0.95	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
tert-Butylbenzene	ND		0.32	0.051	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Tetrahydrofuran	ND		0.51	0.064	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50
Xylenes, Total	**1.5**	**J**	0.64	0.089	mg/Kg	☼	11/12/20 22:07	11/23/20 02:01	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*3.9*	*J N*	*mg/Kg*	☼	*11.12*		*11/12/20 22:07*	*11/23/20 02:01*	*50*
Unknown	*2.5*	*J N*	*mg/Kg*	☼	*11.23*		*11/12/20 22:07*	*11/23/20 02:01*	*50*
Unknown	*2.9*	*J N*	*mg/Kg*	☼	*11.57*		*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 1-ethyl-3-methyl-	*4.1*	*J N*	*mg/Kg*	☼	*12.56*	*620-14-4*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 1-ethyl-4-methyl-	*2.2*	*J N*	*mg/Kg*	☼	*12.59*	*622-96-8*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 1-ethyl-2-methyl-	*2.0*	*J N*	*mg/Kg*	☼	*12.78*	*611-14-3*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 1-methyl-3-propyl-	*2.3*	*J N*	*mg/Kg*	☼	*13.37*	*1074-43-7*	*11/12/20 22:07*	*11/23/20 02:01*	*50*
Benzene, 2-ethyl-1,3-dimethyl-	*2.5*	*J N*	*mg/Kg*	☼	*13.68*	*2870-04-4*	*11/12/20 22:07*	*11/23/20 02:01*	*50*

Client Sample ID: B55-PDI-SB-02 (10-12)

Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3

Matrix: Soil
Percent Solids: 85.2

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Benzene, 1,2,4,5-tetramethyl-	1.9	T J N	mg/Kg	☼	13.96	95-93-2	11/12/20 22:07	11/23/20 02:01	50
Benzene, 2-ethenyl-1,4-dimethyl-	2.7	T J N	mg/Kg	☼	14.30	2039-89-6	11/12/20 22:07	11/23/20 02:01	50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	110		54 - 135	11/12/20 22:07	11/23/20 02:01	50
4-Bromofluorobenzene (Surr)	134	X	50 - 131	11/12/20 22:07	11/23/20 02:01	50
Dibromofluoromethane (Surr)	105		50 - 141	11/12/20 22:07	11/23/20 02:01	50
Toluene-d8 (Surr)	113		52 - 141	11/12/20 22:07	11/23/20 02:01	50

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	**34**	D	3.2	0.32	mg/Kg	☼	11/12/20 22:07	11/23/20 02:22	500

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	111		54 - 135	11/12/20 22:07	11/23/20 02:22	500
4-Bromofluorobenzene (Surr)	137	X	50 - 131	11/12/20 22:07	11/23/20 02:22	500
Dibromofluoromethane (Surr)	105		50 - 141	11/12/20 22:07	11/23/20 02:22	500
Toluene-d8 (Surr)	113		52 - 141	11/12/20 22:07	11/23/20 02:22	500

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
1,2,4,5-Tetrachlorobenzene	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,2'-oxybis[1-chloropropane]	ND		0.050	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,3,4,6-Tetrachlorophenol	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4,5-Trichlorophenol	ND		0.077	0.035	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4,6-Trichlorophenol	ND		0.065	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4-Dichlorophenol	ND		0.050	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4-Dimethylphenol	ND		0.077	0.035	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4-Dinitrophenol	ND		1.2	0.39	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,4-Dinitrotoluene	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2,6-Dinitrotoluene	ND		0.058	0.027	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Chloronaphthalene	ND		0.039	0.0077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Chlorophenol	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Methylnaphthalene	**0.41**		0.039	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Methylphenol	ND		0.077	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Nitroaniline	ND		0.058	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
2-Nitrophenol	ND		0.065	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
3,3'-Dichlorobenzidine	ND		0.39	0.12	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
3-Nitroaniline	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4,6-Dinitro-2-methylphenol	ND		0.58	0.27	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Bromophenyl-phenylether	ND		0.058	0.027	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Chloro-3-methylphenol	ND		0.058	0.027	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
3,4-Methylphenol	ND		0.058	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Nitroaniline	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Nitrophenol	ND		0.58	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Acenaphthene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Acenaphthylene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Acetophenone	ND		0.058	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Anthracene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1

Client Sample ID: B55-PDI-SB-02 (10-12)
Lab Sample ID: 410-20273-3

Date Collected: 11/10/20 09:55
Matrix: Soil

Date Received: 11/11/20 11:00
Percent Solids: 85.2

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Atrazine	ND		0.50	0.23	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzaldehyde	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzo[a]anthracene	ND		0.019	0.0077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzo[a]pyrene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzo[b]fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzo[g,h,i]perylene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzo[k]fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Bis(2-chloroethoxy)methane	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Bis(2-chloroethyl)ether	ND		0.058	0.027	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Bis(2-ethylhexyl) phthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Butylbenzylphthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Caprolactam	ND		0.19	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Carbazole	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Chrysene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Di-n-butyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Di-n-octyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Dibenz(a,h)anthracene	ND		0.019	0.0077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Dibenzofuran	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Diethyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Dimethyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Chloroaniline	ND		0.19	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Fluorene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
4-Chlorophenyl-phenyl ether	ND		0.050	0.023	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Hexachlorobenzene	ND		0.019	0.0077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Hexachlorobutadiene	ND		0.089	0.042	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Hexachlorocyclopentadiene	ND		0.58	0.23	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Hexachloroethane	ND		0.19	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Indeno[1,2,3-cd]pyrene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Isophorone	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
N-Nitrosodi-n-propylamine	ND		0.058	0.027	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
N-Nitrosodiphenylamine	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Naphthalene	**0.060**		0.019	0.0077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Nitrobenzene	ND		0.077	0.031	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Phenanthrene	**0.014**	**J**	0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Aniline	ND		0.58	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Phenol	ND		0.042	0.019	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Pyrene	ND		0.019	0.0039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Pentachlorophenol	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Benzyl alcohol	ND		0.58	0.19	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
n,n'-Dimethylaniline	ND		0.19	0.039	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Pyridine	ND		0.19	0.077	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
Triethylamine	ND	~~*~~ ~~*~~ J	5.8	1.9	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1
1,4-Dioxane	ND		0.39	0.12	mg/Kg	☼	11/16/20 00:40	11/24/20 14:38	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*16*	*~~T~~ J N*	*mg/Kg*	☼	*3.30*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*25*	*~~T~~ J ~~B~~ N*	*mg/Kg*	☼	*3.93*		*11/16/20 00:40*	*11/24/20 14:38*	*1*
2-Cyclohexen-1-one	*0.44*	*~~T~~ J N*	*mg/Kg*	☼	*4.82*	*930-68-7*	*11/16/20 00:40*	*11/24/20 14:38*	*1*
Unknown	*0.61*	*~~T~~ J N*	*mg/Kg*	☼	*5.03*		*11/16/20 00:40*	*11/24/20 14:38*	*1*

Client Sample ID: B55-PDI-SB-02 (10-12)

Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3

Matrix: Soil
Percent Solids: 85.2

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Benzene, 1,3,5-trimethyl-	0.59	T J N	mg/Kg	☼	5.38	108-67-8	11/16/20 00:40	11/24/20 14:38	1
Unknown	0.52	T J N	mg/Kg	☼	5.45		11/16/20 00:40	11/24/20 14:38	1
Benzene, 1,2-diethyl-	0.80	T J N	mg/Kg	☼	5.86	135-01-3	11/16/20 00:40	11/24/20 14:38	1
Benzene, 2-ethyl-1,4-dimethyl-	0.40	T J N	mg/Kg	☼	6.00	1758-88-9	11/16/20 00:40	11/24/20 14:38	1
1,2,4-Trithiolane	1.8	T J N	mg/Kg	☼	6.21	289-16-7	11/16/20 00:40	11/24/20 14:38	1
Unknown	0.74	T J N	mg/Kg	☼	6.32		11/16/20 00:40	11/24/20 14:38	1
1-Phenyl-1-butene	0.53	T J N	mg/Kg	☼	6.53	824-90-8	11/16/20 00:40	11/24/20 14:38	1
Unknown	0.60	T J N	mg/Kg	☼	7.11		11/16/20 00:40	11/24/20 14:38	1
Unknown	1.4	T J N	mg/Kg	☼	8.33		11/16/20 00:40	11/24/20 14:38	1
Unknown	0.56	T J N	mg/Kg	☼	8.42		11/16/20 00:40	11/24/20 14:38	1
Unknown	0.43	T J N	mg/Kg	☼	8.54		11/16/20 00:40	11/24/20 14:38	1
Cyclohexanamine, N-cyclohexyl-N-methyl-	1.3	T J N	mg/Kg	☼	8.62	7560-83-0	11/16/20 00:40	11/24/20 14:38	1
Unknown	0.93	T J N	mg/Kg	☼	8.66		11/16/20 00:40	11/24/20 14:38	1
Unknown	0.64	T J N	mg/Kg	☼	9.34		11/16/20 00:40	11/24/20 14:38	1
Unknown	0.50	T J N	mg/Kg	☼	9.38		11/16/20 00:40	11/24/20 14:38	1
Unknown	0.61	T J N	mg/Kg	☼	9.41		11/16/20 00:40	11/24/20 14:38	1
Unknown	0.70	T J N	mg/Kg	☼	9.44		11/16/20 00:40	11/24/20 14:38	1
Ethanone, 1-(2,7-dimethylpyrazolo[1,5-a]pyridin-3-yl)-	2.6	T J N	mg/Kg	☼	9.69	17408-30-9	11/16/20 00:40	11/24/20 14:38	1
Unknown	0.68	T J N	mg/Kg	☼	9.77		11/16/20 00:40	11/24/20 14:38	1
Unknown	0.42	T J N	mg/Kg	☼	10.04		11/16/20 00:40	11/24/20 14:38	1
Unknown	0.64	T J N	mg/Kg	☼	10.09		11/16/20 00:40	11/24/20 14:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	98		45 - 108	11/16/20 00:40	11/24/20 14:38	1
Nitrobenzene-d5 (Surr)	65		32 - 97	11/16/20 00:40	11/24/20 14:38	1
2-Fluorophenol (Surr)	79		26 - 96	11/16/20 00:40	11/24/20 14:38	1
2-Fluorobiphenyl (Surr)	87		39 - 100	11/16/20 00:40	11/24/20 14:38	1
2,4,6-Tribromophenol (Surr)	71		13 - 121	11/16/20 00:40	11/24/20 14:38	1
Phenol-d5 (Surr)	87		27 - 104	11/16/20 00:40	11/24/20 14:38	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**8.6**	D	6.9	2.3	mg/Kg	☼	11/16/20 00:40	11/26/20 16:33	3

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	88		45 - 108	11/16/20 00:40	11/26/20 16:33	3
Nitrobenzene-d5 (Surr)	63		32 - 97	11/16/20 00:40	11/26/20 16:33	3
2-Fluorophenol (Surr)	71		26 - 96	11/16/20 00:40	11/26/20 16:33	3
2-Fluorobiphenyl (Surr)	77		39 - 100	11/16/20 00:40	11/26/20 16:33	3
2,4,6-Tribromophenol (Surr)	54		13 - 121	11/16/20 00:40	11/26/20 16:33	3
Phenol-d5 (Surr)	76		27 - 104	11/16/20 00:40	11/26/20 16:33	3

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	J	59	29	ug/Kg	☼	11/14/20 08:33	11/18/20 22:08	1
Formaldehyde	**81**	J	88	29	ug/Kg	☼	11/14/20 08:33	11/18/20 22:08	1
Glutaraldehyde	ND	J	59	29	ug/Kg	☼	11/14/20 08:33	11/18/20 22:08	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-20273-1

Client Sample ID: B55-PDI-SB-02 (10-12)
Date Collected: 11/10/20 09:55
Date Received: 11/11/20 11:00

Lab Sample ID: 410-20273-3
Matrix: Soil
Percent Solids: 85.2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	132		77 - 133	11/14/20 08:33	11/18/20 22:08	1

ARCADIS Design & Consultancy for natural and built assets

Bristol-Myers Squibb

Thompson Road Investigation

Data Usability Summary Report

Syracuse, NY

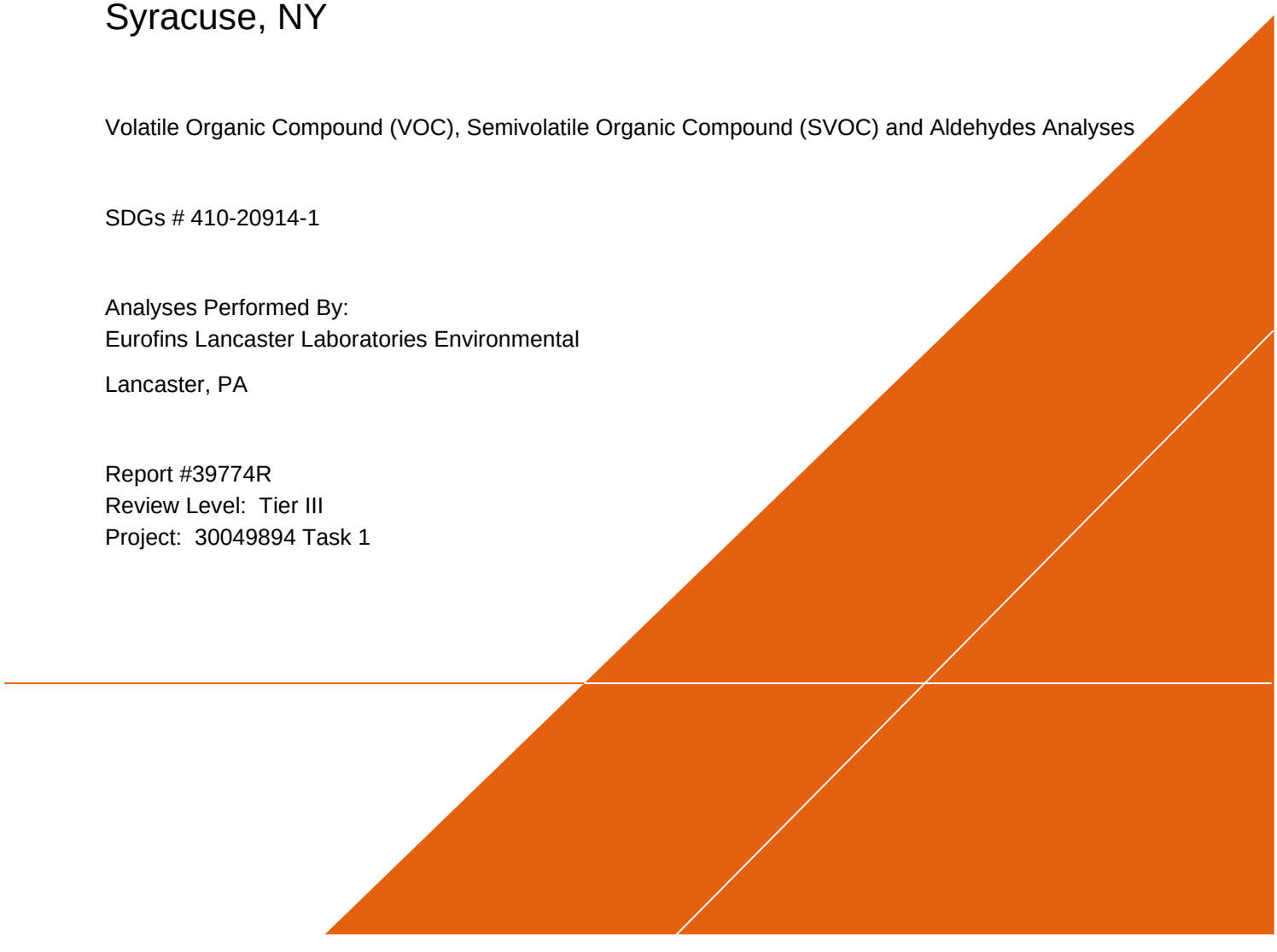
Volatile Organic Compound (VOC), Semivolatile Organic Compound (SVOC) and Aldehydes Analyses

SDGs # 410-20914-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental

Lancaster, PA

Report #39774R
Review Level: Tier III
Project: 30049894 Task 1



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # 410-20914-1 for samples collected in association with the with the Bristol-Myers Squibb Thompson Road Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PFAS	MET	ALD
410-20914-1	B55-PDI-13 (6-8)	410-20914-1	Soil	11/13/2020		X	X			X
	B55-PDI-13 (12-12.5)	410-20914-2	Soil	11/13/2020		X	X			X
	B55-PDI-07 (13-14)	410-20914-3	Soil	11/13/2020	Date Collected is 11/11/20	X	X			X
	B55-PDI-11 (5-6)	410-20914-4	Soil	11/13/2020	Date Collected is 11/12/20	X	X			X
	EB11132020	410-20914-5	Water	11/13/2020			X			X
	B55-PDI-SB-15 (8-9)	410-20914-6	Soil	11/13/2020		X	X			X

Notes:

1. Aldehydes include Acetaldehyde, Formaldehyde and Glutaraldehyde.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X	X*		
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

1. The laboratory noted EB11132020 and TB20083 were listed on the Chain of custody, but no containers were received for the VOC fraction of associated with EB11132020 and TB20083.

List of Acronyms

%D: Percent Difference

%R: Percent Recovery

AC: Acceptable

ALC/GLY: Alcohols/Glycols

BAL: Blank Action Level

CCV: Continuing Calibration Verification

CRDL: Contract Required Detection Limit

D: Dilution

EIS: Extractable Internal Standard

FB: Field Blank

FD: Field Duplicate

ALD: Aldehydes

GC/ECD: Gas Chromatograph/Electron Capture Detector

GC/MS: Gas Chromatograph/Mass spectrometer

HT: Holding Time

ICP: Inductively Coupled Plasma

ICS: Interference Control Sample

ICV: Initial Calibration Verification

ISTD: Internal Standards

LabDup: Laboratory Duplicate

LCS: Lab Control Sample

LCSD: Lab Control Sample Duplicate

LL: Lower Control Limit

MB: Method Blank

MDL: Method Detection Limit

MET: Metals

MS: Matrix Spike

MSD: Matrix Spike Duplicate

N/A: Not Applicable

NC: Not Compliant

List of Acronyms, Continued

PAH: Polyaromatic Hydrocarbon

PCB: Polychlorinated Biphenyl

PEST: Pesticide

PFAS: Per- and Polyfluoroalkyl Substances

QA: Quality Assurance

QC: Quality Control

RB: Rinse Blank

RL: Reporting Limit

RPD: Relative Percent Difference

RRF: Relative Response Factor

RSD: Relative Standard Deviation

RT: Retention Time

SDG: Sample Delivery Group

SerDil: Serial Dilution

SIM: Single Ion Monitoring

SOP: Standard Operating Procedure

SSTD: Surrogate Standards

SVOC: Semivolatile Organic Compound

TB: Trip Blank

TIC: Tentatively Identified Compound

TOC: Total Organic Carbon

TOTDIS: Total and Dissolved

UL: Upper Control Limit

USEPA: United States Environmental Protection Agency

VOC: Volatile Organic Compound

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW846 methods 8260C, 8270D and 8315A. Data were reviewed in accordance with EPA 540-R-2017-002, January 2017 (with reference to the historical USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999, as appropriate.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.

- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260C	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.
	Soil	48 hours from collection to extraction and 14 days from extraction to analysis	Cool to <6 °C.

Note:

s.u. Standard units

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. No qualification of the sample results was required.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
B55-PDI-13 (6-8) B55-PDI-11 (5-6)	CCV %D	Chloromethane	-24.9%
		2-Butanone	-25.7%
		2-Nitropropane	101.8%
		Bromoform	21.3%
B55-PDI-13 (12-12.5) B55-PDI-07 (13-14) B55-PDI-SB-15 (8-9)	CCV %D	1,4-Dioxane	33.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
B55-PDI-13 (12-12.5)	1,2-Dichloroethane-d4	AC
	4-Bromofluorobenzene	> UL
	Dibromofluoromethane	AC
	Toluene-d8	AC

Notes:

UL Upper control limit

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J
< LL but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Non-detect	UJ[1]
	Detect	J[1]

Initial/Continuing	Criteria	Sample Result	Qualification

6. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS/MSD analysis was not performed on a sample within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
B55-PDI-13 (6-8)	Bromoform	>UL	>UL
B55-PDI-11 (5-6)	2-Nitropropane	>UL	>UL

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J

Control Limit	Sample Result	Qualification
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with this SDG.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

Tentatively identified compounds (TICs) were identified in all sample locations associated with this SDG. VOC analysis requires that TICs be qualified as estimated (JN).

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)		X	X		
Laboratory Control Sample Duplicate(LCSD)		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)					X
Matrix Spike Duplicate(MSD)					X
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)					X
Surrogate Spike Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	

VOCs: SW-846 8260C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

SEMI-VOLATILE ORGANIC COMPOUND (SVOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270D	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
B55-PDI-13 (6-8) B55-PDI-13 (12-12.5) B55-PDI-11 (5-6)	TIC Unknown RT: 1.78 TIC Unknown RT: 3.90	Detected sample results less than 5 times blank result	R
B55-PDI-07 (13-14)	TIC Unknown RT: 1.78		

Note:

RL Reporting limit

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS/MSD analysis was not performed on a sample within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
B55-PDI-13 (6-8) B55-PDI-13 (12-12.5) B55-PDI-07 (13-14) B55-PDI-11 (5-6) B55-PDI-SB-15 (8-9)	Triethylamine	<LL but >10%	<LL but >10%
EB11132020	Hexachlorocyclopentadiene	<LL but >10%	NA

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with this SDG.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
B55-PDI-13 (6-8)	Dicyclohexylamine	-	43	43 D
B55-PDI-13 (12-12.5)	Dicyclohexylamine	-	4.9	4.9 D
B55-PDI-07 (13-14)	Dicyclohexylamine	-	18	18 D
B55-PDI-SB-15 (8-9)	Dicyclohexylamine	-	5.0	5.0 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

Tentatively identified compounds (TICs) were identified in all sample locations associated with this SDG. SVOC analysis requires that TICs be qualified as estimated (JN).

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270D and 8270D-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
D. Method blanks		X		X	
E. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
F. Reconstructed ion chromatograms		X		X	
G. Quantitation Reports		X		X	
H. RT of sample compounds within the established RT windows		X		X	

SVOCs: SW-846 8270D and 8270D-SIM		Reported		Performance Acceptable		Not Required
		No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)						
I.	Quantitation transcriptions/calculations		X		X	
J.	Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

ALDEHYDES ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8315A	Water	3 days until extraction; 3 days from extraction to analysis	Cool to <6 °C
	Soil	14 days until extraction; 3 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% is allowed or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The

analysis requires that the surrogate compound exhibits recovery within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
B55-PDI-13 (6-8)	Formaldehyde	< 10%	< 10%

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with this SDG.

9. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
B55-PDI-13 (6-8)	Formaldehyde	-	1.4	1.4 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL GC

Aldehyde: SW846 8315A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/FID)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate(MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X			
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

SAMPLE COMPLIANCE REPORT

Sample Delivery Group (SDG)	Sampling Date	Protocol	Sample ID	Matrix	Compliancy[1]					Noncompliance
					VOC	SVOC	ALD	PFAS	MET	
410-20914-1	11/13/2020	SW846	B55-PDI-13 (6-8)	Soil	No	No	No	-	-	VOC: CCV %D, LCS/LCSD %R SVOC: LCS/LCSD %R ALD: MS/MSD %R
	11/13/2020	SW846	B55-PDI-13 (12-12.5)	Soil	No	No	Yes	-	-	VOC: CCV %D, SSTD %R SVOC: LCS/LCSD %R
	11/13/2020	SW846	B55-PDI-07 (13-14)	Soil	No	No	Yes	-	-	VOC: CCV %D SVOC: LCS/LCSD %R
	11/13/2020	SW846	B55-PDI-11 (5-6)	Soil	No	No	Yes	-	-	VOC: CCV %D, LCS/LCSD %R SVOC: LCS/LCSD %R
	11/13/2020	SW846	EB11132020	Water	-	No	Yes	-	-	SVOC: LCS %R
	11/13/2020	SW846	B55-PDI-SB-15 (8-9)	Soil	No	No	Yes	-	-	VOC: CCV %D SVOC: LCS/LCSD %R

Note:

1 Samples which are compliant with no added validation qualifiers are listed as "yes". Samples which are non-compliant or which have added qualifiers are listed as "no". A "no" designation does not necessarily indicate that the data have been rejected or are otherwise unusable.

VALIDATION PERFORMED BY: Jeffrey L. Davin

SIGNATURE: 

DATE: January 20, 2021

PEER REVIEW: Dennis K. Capria

DATE: January 21, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Environmental Analysis R ustody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-20914 Chain of Custody

ıtal use only

COC #616405

Client Information

Client: Arcadis	Acct. #:
Project Name/#: Bristol-Myers Squibb	PWSID #:
Project Manager: William McClure	P.O. #:
Sampler: Sophia Miller	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☒

Matrix: Soil ☒ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: _____

Analysis Requested — Preservation and Filtration Codes

For Lab Use Only
FSC: _____
SCR#: _____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	Short-List Aldehydes 8315A	SVOA 8270 D/E (Miniscan)	VOCs Solid by 8260 C/D	Short-List Aldehydes 8315A	VOCs Water 8260C	SVOAs 8270D MINI	Remarks
BSS-PDI-13 (6-8)	11/13/20	0840		X	X			5	X	X	X				
BSS-PDI-13 (12-12.5)		0900		X	X			5	X	X	X				
BSS-PDI-07 (13-14)		0935		X	X			5	X	X	X				Date Collected is 11/11/20
BSS-PDI 11 (5-6)		0730		X	X			5	X	X	X				Date Collected is 11/12/20
EB 11132020		0700	X			X		6				X	X	X	
TB 20083	3/26/20	Lab Provided				X		1					X		
BSS-PDI-SB-15 (8-9)	11/13/20			X	X			5	X	X	X				

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: Standard

E-mail address: William.McClure@arcadis.com

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	11/13/20	1443			
				11/14/2020	1005

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx X Other _____

Temperature upon receipt 2.7 °C

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*+	LCS and/or LCSD is outside acceptance limits, high biased.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number

Client Sample ID: B55-PDI-13 (6-8)
Lab Sample ID: 410-20914-1
Date Collected: 11/13/20 08:40
Matrix: Soil
Date Received: 11/14/20 10:05

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**16.9**		1.0	1.0	%			11/16/20 20:10	1

Client Sample ID: B55-PDI-13 (6-8)
Lab Sample ID: 410-20914-1
Date Collected: 11/13/20 08:40
Matrix: Soil
Date Received: 11/14/20 10:05
Percent Solids: 83.1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
trans-1,3-Dichloropropene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Ethylbenzene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Styrene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,4-Dichlorobenzene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2-Dibromoethane	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2-Dichloroethane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
4-Methyl-2-pentanone	ND		0.50	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Methylcyclohexane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Toluene	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Chlorobenzene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2,4-Trimethylbenzene	**0.12**	**J**	0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Cyclohexane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2,4-Trichlorobenzene	ND		0.50	0.25	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,4-Dioxane	ND		13	1.9	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Dibromochloromethane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Tetrachloroethene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
cis-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
trans-1,2-Dichloroethene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Methyl tertiary butyl ether	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
m&p-Xylene	ND		0.25	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,3,5-Trimethylbenzene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,3-Dichlorobenzene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Carbon tetrachloride	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
2-Hexanone	ND		0.50	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Acetone	ND		1.0	0.30	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Chloroform	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Benzene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,1,1-Trichloroethane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Bromomethane	ND		0.25	0.035	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Chloromethane	ND	J	0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Bromochloromethane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Chloroethane	ND		0.25	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Vinyl chloride	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Methylene Chloride	ND		0.25	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Carbon disulfide	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Bromoform	ND		0.50	0.25	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Bromodichloromethane	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,1-Dichloroethane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,1-Dichloroethene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Trichlorofluoromethane	ND		0.25	0.035	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Dichlorodifluoromethane	ND		0.25	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50

Client Sample ID: B55-PDI-13 (6-8)
Date Collected: 11/13/20 08:40
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-1
Matrix: Soil
Percent Solids: 83.1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Freon 113	ND		0.50	0.030	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2-Dichloropropane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
2-Butanone	ND	J	0.50	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,1,2-Trichloroethane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
2-Nitropropane	~~ND~~ *	R	0.50	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Trichloroethene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Methyl acetate	ND		0.25	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,1,2,2-Tetrachloroethane	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2,3-Trichlorobenzene	ND		0.50	0.25	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
o-Xylene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2-Dichlorobenzene	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
1,2-Dibromo-3-Chloropropane	ND		0.25	0.025	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Acetonitrile	ND		5.0	1.3	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Isopropylbenzene	ND		0.25	0.020	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Chlorodifluoromethane	ND		0.50	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Cyclohexanone	ND		13	1.3	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Ethyl acetate	ND		0.25	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Ethyl ether	ND		0.25	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Isobutyl alcohol	ND		13	1.9	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Naphthalene	ND		0.25	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
n-Butanol	ND		13	2.8	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
n-Butylbenzene	**0.33**	J	0.40	0.15	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
n-Heptane	ND		0.40	0.15	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
p-Isopropyltoluene	ND		0.25	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
sec-Butylbenzene	ND		0.25	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
t-Butyl alcohol	ND		5.0	0.76	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
tert-Butylbenzene	ND		0.25	0.040	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Tetrahydrofuran	ND		0.40	0.050	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50
Xylenes, Total	ND		0.50	0.071	mg/Kg	☼	11/14/20 16:23	11/23/20 02:42	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Pentane, 2,4-dimethyl-	*5.8*	*T J N*	*mg/Kg*	☼	*6.06*	*108-08-7*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Pentane, 2,3-dimethyl-	*12*	*T J N*	*mg/Kg*	☼	*7.19*	*565-59-3*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Unknown	*6.6*	*T J N*	*mg/Kg*	☼	*7.68*		*11/14/20 16:23*	*11/23/20 02:42*	*50*
Hexane, 2,5-dimethyl-	*10*	*T J N*	*mg/Kg*	☼	*8.67*	*592-13-2*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Hexane, 2,4-dimethyl-	*6.3*	*T J N*	*mg/Kg*	☼	*8.74*	*589-43-5*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Cyclopentane, 1,2,4-trimethyl-	*9.4*	*T J N*	*mg/Kg*	☼	*9.03*	*2815-58-9*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Unknown	*5.0*	*T J N*	*mg/Kg*	☼	*9.22*		*11/14/20 16:23*	*11/23/20 02:42*	*50*
Unknown	*6.0*	*T J N*	*mg/Kg*	☼	*9.39*		*11/14/20 16:23*	*11/23/20 02:42*	*50*
2-Hexene, 3,5-dimethyl-	*3.9*	*T J N*	*mg/Kg*	☼	*9.50*	*3404-79-3*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Unknown	*4.4*	*T J N*	*mg/Kg*	☼	*9.61*		*11/14/20 16:23*	*11/23/20 02:42*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*54 - 135*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
4-Bromofluorobenzene (Surr)	*124*		*50 - 131*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/14/20 16:23*	*11/23/20 02:42*	*50*
Toluene-d8 (Surr)	*104*		*52 - 141*	*11/14/20 16:23*	*11/23/20 02:42*	*50*

Client Sample ID: B55-PDI-13 (6-8)

Date Collected: 11/13/20 08:40
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-1

Matrix: Soil
Percent Solids: 83.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
1,2,4,5-Tetrachlorobenzene	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,2'-oxybis[1-chloropropane]	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4,5-Trichlorophenol	ND		0.080	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4,6-Trichlorophenol	ND		0.068	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4-Dichlorophenol	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4-Dimethylphenol	ND		0.080	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4-Dinitrophenol	ND		1.2	0.40	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,4-Dinitrotoluene	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2,6-Dinitrotoluene	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Chloronaphthalene	ND		0.040	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Chlorophenol	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Methylnaphthalene	ND		0.040	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Methylphenol	ND		0.080	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Nitroaniline	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
2-Nitrophenol	ND		0.068	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
3,3'-Dichlorobenzidine	ND		0.40	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
3-Nitroaniline	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4,6-Dinitro-2-methylphenol	ND		0.60	0.28	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Bromophenyl-phenylether	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Chloro-3-methylphenol	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
3,4-Methylphenol	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Nitroaniline	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Nitrophenol	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Acenaphthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Acenaphthylene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Acetophenone	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Anthracene	**0.0079**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Atrazine	ND		0.52	0.24	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzaldehyde	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzo[a]anthracene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzo[a]pyrene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzo[b]fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzo[g,h,i]perylene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzo[k]fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Bis(2-chloroethoxy)methane	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Bis(2-chloroethyl)ether	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Butylbenzylphthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Caprolactam	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Carbazole	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Chrysene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Di-n-butyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Di-n-octyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Dibenz(a,h)anthracene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Dibenzofuran	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Diethyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Dimethyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1

Client Sample ID: B55-PDI-13 (6-8)

Date Collected: 11/13/20 08:40
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-1

Matrix: Soil
Percent Solids: 83.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Chloroaniline	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Fluorene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
4-Chlorophenyl-phenyl ether	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Hexachlorobenzene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Hexachlorobutadiene	ND		0.092	0.044	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Hexachlorocyclopentadiene	ND		0.60	0.24	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Hexachloroethane	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Isophorone	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
N-Nitrosodi-n-propylamine	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
N-Nitrosodiphenylamine	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Naphthalene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Nitrobenzene	ND		0.080	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Phenanthrene	**0.0071**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Aniline	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Phenol	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Pyrene	**0.017**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Pentachlorophenol	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Benzyl alcohol	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
n,n'-Dimethylaniline	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Pyridine	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
Triethylamine	ND	J	6.0	2.0	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1
1,4-Dioxane	ND		0.40	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 15:02	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.6*	*T J B* R	*mg/Kg*	☼	*1.78*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.34*	*T J* N	*mg/Kg*	☼	*3.25*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.92*	*T J B* R	*mg/Kg*	☼	*3.90*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.51*	*T J* N	*mg/Kg*	☼	*4.63*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.40*	*T J* N	*mg/Kg*	☼	*4.76*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.54*	*T J* N	*mg/Kg*	☼	*4.81*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Nonane, 3-methyl-	*0.58*	*T J N*	*mg/Kg*	☼	*4.85*	*5911-04-6*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.36*	*T J* N	*mg/Kg*	☼	*5.03*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.56*	*T J* N	*mg/Kg*	☼	*5.09*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.49*	*T J* N	*mg/Kg*	☼	*5.68*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Benzene, 1-methyl-4-(1-methylethyl)-	*0.62*	*T J N*	*mg/Kg*	☼	*6.41*	*99-87-6*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.73*	*T J* N	*mg/Kg*	☼	*6.57*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.80*	*T J* N	*mg/Kg*	☼	*6.62*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Benzene, 1-methyl-4-(1-methylpropyl)-	*1.1*	*T J N*	*mg/Kg*	☼	*6.67*	*1595-16-0*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Benzene, pentamethyl-	*0.61*	*T J N*	*mg/Kg*	☼	*6.81*	*700-12-9*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.73*	*T J* N	*mg/Kg*	☼	*6.88*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.36*	*T J* N	*mg/Kg*	☼	*6.94*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.34*	*T J* N	*mg/Kg*	☼	*7.11*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.64*	*T J* N	*mg/Kg*	☼	*7.24*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Benzene, 1-(1-methylethenyl)-3-(1-methylethyl)-	*0.50*	*T J N*	*mg/Kg*	☼	*7.40*	*1129-29-9*	*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*0.38*	*T J* N	*mg/Kg*	☼	*7.60*		*11/18/20 16:18*	*11/24/20 15:02*	*1*
Unknown	*8.0*	*T J* N	*mg/Kg*	☼	*8.23*		*11/18/20 16:18*	*11/24/20 15:02*	*1*

Client Sample ID: B55-PDI-13 (6-8)
Lab Sample ID: 410-20914-1
Date Collected: 11/13/20 08:40
Matrix: Soil
Date Received: 11/14/20 10:05
Percent Solids: 83.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Cyclohexanamine, N-cyclohexyl-N-methyl-	0.43	TJN	mg/Kg	☼	8.63	7560-83-0	11/18/20 16:18	11/24/20 15:02	1
Unknown	0.64	TJN	mg/Kg	☼	8.91		11/18/20 16:18	11/24/20 15:02	1
Cyclic octaatomic sulfur	3.5	TJN	mg/Kg	☼	11.18	10544-50-0	11/18/20 16:18	11/24/20 15:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	105		45 - 108	11/18/20 16:18	11/24/20 15:02	1
Nitrobenzene-d5 (Surr)	77		32 - 97	11/18/20 16:18	11/24/20 15:02	1
2-Fluorophenol (Surr)	88		26 - 96	11/18/20 16:18	11/24/20 15:02	1
2-Fluorobiphenyl (Surr)	88		39 - 100	11/18/20 16:18	11/24/20 15:02	1
2,4,6-Tribromophenol (Surr)	92		13 - 121	11/18/20 16:18	11/24/20 15:02	1
Phenol-d5 (Surr)	95		27 - 104	11/18/20 16:18	11/24/20 15:02	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**43**	D	24	8.0	mg/Kg	☼	11/18/20 16:18	11/25/20 18:24	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	88		45 - 108	11/18/20 16:18	11/25/20 18:24	10
Nitrobenzene-d5 (Surr)	67		32 - 97	11/18/20 16:18	11/25/20 18:24	10
2-Fluorophenol (Surr)	77		26 - 96	11/18/20 16:18	11/25/20 18:24	10
2-Fluorobiphenyl (Surr)	77		39 - 100	11/18/20 16:18	11/25/20 18:24	10
2,4,6-Tribromophenol (Surr)	69		13 - 121	11/18/20 16:18	11/25/20 18:24	10
Phenol-d5 (Surr)	80		27 - 104	11/18/20 16:18	11/25/20 18:24	10

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	**0.058**	J	0.060	0.030	mg/Kg	☼	11/17/20 17:30	11/18/20 23:17	1
Glutaraldehyde	ND		0.060	0.030	mg/Kg	☼	11/17/20 17:30	11/18/20 23:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	112		77 - 133	11/17/20 17:30	11/18/20 23:17	1

Method: 8315A - Carbonyl Compounds by HPLC - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	**1.4**	~~F1~~ D	0.45	0.15	mg/Kg	☼	11/17/20 17:30	11/19/20 16:50	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	108		77 - 133	11/17/20 17:30	11/19/20 16:50	5

Client Sample ID: B55-PDI-13 (12-12.5)
Lab Sample ID: 410-20914-2
Date Collected: 11/13/20 09:00
Matrix: Soil
Date Received: 11/14/20 10:05

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.4**		1.0	1.0	%			11/16/20 20:10	1

Client Sample ID: B55-PDI-13 (12-12.5)

Date Collected: 11/13/20 09:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-2

Matrix: Soil
Percent Solids: 90.6

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,1,2,2-Tetrachloroethane	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,1,2-Trichloroethane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,1-Dichloroethane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,1-Dichloroethene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2,3-Trichlorobenzene	ND		0.0069	0.0034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2,4-Trichlorobenzene	ND		0.0069	0.0034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2,4-Trimethylbenzene	**0.095**	J	0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2-Dibromo-3-Chloropropane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2-Dibromoethane	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2-Dichlorobenzene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2-Dichloroethane	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,2-Dichloropropane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,3,5-Trimethylbenzene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,3-Dichlorobenzene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,4-Dichlorobenzene	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
1,4-Dioxane	ND		0.17	0.025	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
2-Butanone	**0.013**	J	0.0069	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
2-Hexanone	ND		0.0069	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
2-Nitropropane	ND		0.0069	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
4-Methyl-2-pentanone	ND		0.0069	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Acetone	**0.019**	J	0.014	0.0041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Acetonitrile	ND		0.069	0.017	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Benzene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Bromochloromethane	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Bromodichloromethane	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Bromoform	ND		0.0069	0.0034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Bromomethane	ND		0.0034	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Carbon disulfide	**0.0036**	J	0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Carbon tetrachloride	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Chlorobenzene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Chlorodifluoromethane	ND		0.0069	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Chloroethane	ND		0.0034	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Chloroform	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Chloromethane	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
cis-1,2-Dichloroethene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
cis-1,3-Dichloropropene	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Cyclohexane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Cyclohexanone	**0.44**	J	0.17	0.017	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Dibromochloromethane	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Dichlorodifluoromethane	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Ethyl acetate	ND		0.0034	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Ethyl ether	ND		0.0034	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Ethylbenzene	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Freon 113	ND		0.0069	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Isobutyl alcohol	ND		0.17	0.026	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Isopropylbenzene	**0.0025**	J	0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
m&p-Xylene	ND		0.0034	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Methyl acetate	ND		0.0034	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1

Client Sample ID: B55-PDI-13 (12-12.5)
Lab Sample ID: 410-20914-2

Date Collected: 11/13/20 09:00
Matrix: Soil

Date Received: 11/14/20 10:05
Percent Solids: 90.6

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Methylcyclohexane	**0.021**	J	0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Methylene Chloride	ND		0.0034	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Naphthalene	**0.0021**	J	0.0034	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
n-Butanol	ND		0.17	0.039	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
n-Butylbenzene	**0.021**	J	0.0055	0.0021	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
n-Heptane	ND		0.0055	0.0021	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
o-Xylene	**0.00030**	J	0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
p-Isopropyltoluene	**0.011**	J	0.0034	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
sec-Butylbenzene	**0.0090**	J	0.0034	0.0014	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Styrene	ND		0.0034	0.00028	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
t-Butyl alcohol	ND		0.069	0.010	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
tert-Butylbenzene	ND		0.0034	0.00055	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Tetrachloroethene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Tetrahydrofuran	ND		0.0055	0.00069	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Toluene	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
trans-1,2-Dichloroethene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
trans-1,3-Dichloropropene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Trichloroethene	ND		0.0034	0.00034	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Trichlorofluoromethane	ND		0.0034	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Vinyl chloride	ND		0.0034	0.00041	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1
Xylenes, Total	ND		0.0069	0.00096	mg/Kg	☼	11/14/20 16:21	11/24/20 14:49	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Pentane, 2,3-dimethyl-	*0.090*	*J N*	*mg/Kg*	☼	*4.85*	*565-59-3*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Unknown	*0.11*	*J N*	*mg/Kg*	☼	*5.21*		*11/14/20 16:21*	*11/24/20 14:49*	*1*
Hexane, 2,5-dimethyl-	*0.091*	*J N*	*mg/Kg*	☼	*6.00*	*592-13-2*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Hexane, 2,4-dimethyl-	*0.087*	*J N*	*mg/Kg*	☼	*6.05*	*589-43-5*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Cyclopentane, 1,2,4-trimethyl-	*0.11*	*J N*	*mg/Kg*	☼	*6.26*	*2815-58-9*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Unknown	*0.089*	*J N*	*mg/Kg*	☼	*6.43*		*11/14/20 16:21*	*11/24/20 14:49*	*1*
Unknown	*0.14*	*J N*	*mg/Kg*	☼	*6.56*		*11/14/20 16:21*	*11/24/20 14:49*	*1*
Benzene, 1-ethyl-2,3-dimethyl-	*0.11*	*J N*	*mg/Kg*	☼	*10.80*	*933-98-2*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Benzene, 1,2,3,4-tetramethyl-	*0.088*	*J N*	*mg/Kg*	☼	*11.10*	*488-23-3*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Unknown	*0.10*	*J N*	*mg/Kg*	☼	*11.39*		*11/14/20 16:21*	*11/24/20 14:49*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
4-Bromofluorobenzene (Surr)	*133*	*X*	*50 - 131*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/14/20 16:21*	*11/24/20 14:49*	*1*
Toluene-d8 (Surr)	*102*		*52 - 141*	*11/14/20 16:21*	*11/24/20 14:49*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
1,2,4,5-Tetrachlorobenzene	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,2'-oxybis[1-chloropropane]	ND		0.047	0.022	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,3,4,6-Tetrachlorophenol	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4,5-Trichlorophenol	ND		0.073	0.033	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4,6-Trichlorophenol	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4-Dichlorophenol	ND		0.047	0.022	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1

Client Sample ID: B55-PDI-13 (12-12.5)
Date Collected: 11/13/20 09:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-2
Matrix: Soil
Percent Solids: 90.6

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dimethylphenol	ND		0.073	0.033	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4-Dinitrophenol	ND		1.1	0.36	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,4-Dinitrotoluene	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2,6-Dinitrotoluene	ND		0.054	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Chloronaphthalene	ND		0.036	0.0073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Chlorophenol	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Methylnaphthalene	ND		0.036	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Methylphenol	ND		0.073	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Nitroaniline	ND		0.054	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
2-Nitrophenol	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
3,3'-Dichlorobenzidine	ND		0.36	0.11	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
3-Nitroaniline	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4,6-Dinitro-2-methylphenol	ND		0.54	0.25	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Bromophenyl-phenylether	ND		0.054	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Chloro-3-methylphenol	ND		0.054	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
3,4-Methylphenol	ND		0.054	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Nitroaniline	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Nitrophenol	ND		0.54	0.18	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Acenaphthene	ND		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Acenaphthylene	ND		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Acetophenone	ND		0.054	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Anthracene	**0.0060**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Atrazine	ND		0.47	0.22	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzaldehyde	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzo[a]anthracene	**0.019**		0.018	0.0073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzo[a]pyrene	**0.016**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzo[b]fluoranthene	**0.017**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzo[g,h,i]perylene	**0.0050**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzo[k]fluoranthene	**0.010**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Bis(2-chloroethoxy)methane	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Bis(2-chloroethyl)ether	ND		0.054	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Bis(2-ethylhexyl) phthalate	**0.17**	**J**	0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Butylbenzylphthalate	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Caprolactam	ND		0.18	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Carbazole	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Chrysene	**0.014**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Di-n-butyl phthalate	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Di-n-octyl phthalate	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Dibenz(a,h)anthracene	ND		0.018	0.0073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Dibenzofuran	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Diethyl phthalate	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Dimethyl phthalate	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Fluoranthene	**0.039**		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Chloroaniline	ND		0.18	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Fluorene	ND		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
4-Chlorophenyl-phenyl ether	ND		0.047	0.022	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Hexachlorobenzene	ND		0.018	0.0073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Hexachlorobutadiene	ND		0.083	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Hexachlorocyclopentadiene	ND		0.54	0.22	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1

Client Sample ID: B55-PDI-13 (12-12.5)
Lab Sample ID: 410-20914-2

Date Collected: 11/13/20 09:00
Matrix: Soil

Date Received: 11/14/20 10:05
Percent Solids: 90.6

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachloroethane	ND		0.18	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Indeno[1,2,3-cd]pyrene	**0.0055**	**J**	0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Isophorone	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
N-Nitrosodi-n-propylamine	ND		0.054	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
N-Nitrosodiphenylamine	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Naphthalene	ND		0.018	0.0073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Nitrobenzene	ND		0.073	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Phenanthrene	**0.018**		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Aniline	ND		0.54	0.18	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Phenol	ND		0.040	0.018	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Pyrene	**0.040**		0.018	0.0036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Pentachlorophenol	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Benzyl alcohol	ND		0.54	0.18	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
n,n'-Dimethylaniline	ND		0.18	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Pyridine	ND		0.18	0.073	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
Triethylamine	ND	J	5.4	1.8	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1
1,4-Dioxane	ND		0.36	0.11	mg/Kg	☼	11/18/20 16:18	11/24/20 15:26	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.53*	*J B* R	*mg/Kg*	☼	*1.78*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.34*	*J B* R	*mg/Kg*	☼	*3.90*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.17*	*J* N	*mg/Kg*	☼	*4.82*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.22*	*J* N	*mg/Kg*	☼	*4.93*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.21*	*J* N	*mg/Kg*	☼	*6.53*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.18*	*J* N	*mg/Kg*	☼	*6.81*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.33*	*J* N	*mg/Kg*	☼	*8.19*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.44*	*J* N	*mg/Kg*	☼	*8.27*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.23*	*J* N	*mg/Kg*	☼	*8.34*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.42*	*J* N	*mg/Kg*	☼	*8.38*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Unknown	*0.46*	*J* N	*mg/Kg*	☼	*8.77*		*11/18/20 16:18*	*11/24/20 15:26*	*1*
Cyclic octaatomic sulfur	*0.40*	*J N*	*mg/Kg*	☼	*11.17*	*10544-50-0*	*11/18/20 16:18*	*11/24/20 15:26*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*99*		*45 - 108*	*11/18/20 16:18*	*11/24/20 15:26*	*1*
Nitrobenzene-d5 (Surr)	*75*		*32 - 97*	*11/18/20 16:18*	*11/24/20 15:26*	*1*
2-Fluorophenol (Surr)	*86*		*26 - 96*	*11/18/20 16:18*	*11/24/20 15:26*	*1*
2-Fluorobiphenyl (Surr)	*87*		*39 - 100*	*11/18/20 16:18*	*11/24/20 15:26*	*1*
2,4,6-Tribromophenol (Surr)	*95*		*13 - 121*	*11/18/20 16:18*	*11/24/20 15:26*	*1*
Phenol-d5 (Surr)	*91*		*27 - 104*	*11/18/20 16:18*	*11/24/20 15:26*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**4.9**	D	4.4	1.5	mg/Kg	☼	11/18/20 16:18	11/25/20 18:48	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*88*		*45 - 108*	*11/18/20 16:18*	*11/25/20 18:48*	*2*
Nitrobenzene-d5 (Surr)	*68*		*32 - 97*	*11/18/20 16:18*	*11/25/20 18:48*	*2*
2-Fluorophenol (Surr)	*76*		*26 - 96*	*11/18/20 16:18*	*11/25/20 18:48*	*2*
2-Fluorobiphenyl (Surr)	*78*		*39 - 100*	*11/18/20 16:18*	*11/25/20 18:48*	*2*
2,4,6-Tribromophenol (Surr)	*77*		*13 - 121*	*11/18/20 16:18*	*11/25/20 18:48*	*2*

Client Sample ID: B55-PDI-13 (12-12.5)
Lab Sample ID: 410-20914-2
Date Collected: 11/13/20 09:00
Matrix: Soil
Date Received: 11/14/20 10:05
Percent Solids: 90.6

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Phenol-d5 (Surr)	*81*		*27 - 104*	*11/18/20 16:18*	*11/25/20 18:48*	*2*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.055	0.028	mg/Kg	☼	11/17/20 17:30	11/18/20 23:29	1
Formaldehyde	**0.12**		0.083	0.028	mg/Kg	☼	11/17/20 17:30	11/18/20 23:29	1
Glutaraldehyde	ND		0.055	0.028	mg/Kg	☼	11/17/20 17:30	11/18/20 23:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*106*		*77 - 133*	*11/17/20 17:30*	*11/18/20 23:29*	*1*

Client Sample ID: B55-PDI-07 (13-14)
Lab Sample ID: 410-20914-3
Date Collected: 11/13/20 09:35
Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Date Received: 11/14/20 10:05

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**19.5**		1.0	1.0	%			11/16/20 20:10	1

Client Sample ID: B55-PDI-07 (13-14)
Lab Sample ID: 410-20914-3
Date Collected: 11/13/20 09:35
Matrix: Soil
Date Received: 11/14/20 10:05
Percent Solids: 80.5

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,1,2,2-Tetrachloroethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,1,2-Trichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,1-Dichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,1-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2,3-Trichlorobenzene	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2,4-Trichlorobenzene	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2,4-Trimethylbenzene	**0.00040**	**J**	0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2-Dibromo-3-Chloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2-Dibromoethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2-Dichloroethane	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,2-Dichloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,3,5-Trimethylbenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,3-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,4-Dichlorobenzene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
1,4-Dioxane	ND		0.20	0.029	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
2-Butanone	**0.0050**	**J**	0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
2-Hexanone	ND		0.0079	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
2-Nitropropane	ND		0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
4-Methyl-2-pentanone	ND		0.0079	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Acetone	**0.027**		0.016	0.0048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Acetonitrile	ND		0.079	0.020	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Benzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Bromochloromethane	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1

Client Sample ID: B55-PDI-07 (13-14)

Date Collected: 11/13/20 09:35 Date Collected is 11/11/20
Date Received: 11/14/20 10:05 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-3

Matrix: Soil
Percent Solids: 80.5

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromodichloromethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Bromoform	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Bromomethane	ND		0.0040	0.00056	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Carbon disulfide	**0.00079**	**J**	0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Carbon tetrachloride	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Chlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Chlorodifluoromethane	ND		0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Chloroethane	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Chloroform	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Chloromethane	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
cis-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
cis-1,3-Dichloropropene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Cyclohexane	**0.027**		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Cyclohexanone	**0.033**	**J**	0.20	0.020	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Dibromochloromethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Dichlorodifluoromethane	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Ethyl acetate	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Ethyl ether	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Ethylbenzene	**0.017**		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Freon 113	ND		0.0079	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Isobutyl alcohol	ND		0.20	0.030	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Isopropylbenzene	**0.0063**		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
m&p-Xylene	**0.0060**		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Methyl acetate	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Methyl tertiary butyl ether	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Methylcyclohexane	**0.0060**		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Methylene Chloride	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Naphthalene	**0.0061**		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
n-Butanol	ND		0.20	0.044	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
n-Butylbenzene	**0.0027**	**J**	0.0064	0.0024	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
n-Heptane	ND		0.0064	0.0024	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
o-Xylene	**0.0033**	**J**	0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
p-Isopropyltoluene	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
sec-Butylbenzene	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Styrene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
t-Butyl alcohol	ND		0.079	0.012	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
tert-Butylbenzene	ND		0.0040	0.00064	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Tetrachloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Tetrahydrofuran	ND		0.0064	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Toluene	**0.00060**	**J**	0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
trans-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
trans-1,3-Dichloropropene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Trichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Trichlorofluoromethane	ND		0.0040	0.00056	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Vinyl chloride	ND		0.0040	0.00048	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1
Xylenes, Total	**0.0093**		0.0079	0.0011	mg/Kg	☼	11/14/20 16:21	11/24/20 15:11	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Butane, 2-methyl-	*0.031*	*T J N*	*mg/Kg*	☼	*2.01*	*78-78-4*	*11/14/20 16:21*	*11/24/20 15:11*	*1*
Unknown	*0.039*	*T J N*	*mg/Kg*	☼	*2.08*		*11/14/20 16:21*	*11/24/20 15:11*	*1*

Client Sample ID: B55-PDI-07 (13-14)

Date Collected: 11/13/20 09:35
Date Received: 11/14/20 10:05

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-3

Matrix: Soil
Percent Solids: 80.5

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	0.012	T J N	mg/Kg	☼	6.56		11/14/20 16:21	11/24/20 15:11	1
Benzene, propyl-	0.030	T J N	mg/Kg	☼	9.62	103-65-1	11/14/20 16:21	11/24/20 15:11	1
Benzene, 1-ethyl-2-methyl-	0.028	T J N	mg/Kg	☼	9.90	611-14-3	11/14/20 16:21	11/24/20 15:11	1
Benzene, cyclopropyl-	0.033	T J N	mg/Kg	☼	10.47	873-49-4	11/14/20 16:21	11/24/20 15:11	1
Benzene, 1-ethyl-2,3-dimethyl-	0.020	T J N	mg/Kg	☼	10.80	933-98-2	11/14/20 16:21	11/24/20 15:11	1
Benzene, (2-methyl-1-propenyl)-	0.017	T J N	mg/Kg	☼	10.88	768-49-0	11/14/20 16:21	11/24/20 15:11	1
Benzene, 1,2,3,4-tetramethyl-	0.021	T J N	mg/Kg	☼	11.06	488-23-3	11/14/20 16:21	11/24/20 15:11	1
Benzene, 1-methyl-4-(2-propenyl)-	0.013	T J N	mg/Kg	☼	11.39	3333-13-9	11/14/20 16:21	11/24/20 15:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		54 - 135	11/14/20 16:21	11/24/20 15:11	1
4-Bromofluorobenzene (Surr)	98		50 - 131	11/14/20 16:21	11/24/20 15:11	1
Dibromofluoromethane (Surr)	99		50 - 141	11/14/20 16:21	11/24/20 15:11	1
Toluene-d8 (Surr)	103		52 - 141	11/14/20 16:21	11/24/20 15:11	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
1,2,4,5-Tetrachlorobenzene	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,2'-oxybis[1-chloropropane]	ND		0.053	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4,5-Trichlorophenol	ND		0.082	0.037	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4,6-Trichlorophenol	ND		0.070	0.033	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4-Dichlorophenol	ND		0.053	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4-Dimethylphenol	ND		0.082	0.037	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4-Dinitrophenol	ND		1.2	0.41	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,4-Dinitrotoluene	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2,6-Dinitrotoluene	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Chloronaphthalene	ND		0.041	0.0082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Chlorophenol	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Methylnaphthalene	ND		0.041	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Methylphenol	ND		0.082	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Nitroaniline	ND		0.062	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
2-Nitrophenol	ND		0.070	0.033	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
3,3'-Dichlorobenzidine	ND		0.41	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
3-Nitroaniline	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4,6-Dinitro-2-methylphenol	ND		0.62	0.29	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Bromophenyl-phenylether	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Chloro-3-methylphenol	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
3,4-Methylphenol	ND		0.062	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Nitroaniline	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Nitrophenol	ND		0.62	0.21	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Acenaphthene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Acenaphthylene	**0.042**		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Acetophenone	ND		0.062	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Anthracene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Atrazine	ND		0.53	0.25	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzaldehyde	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzo[a]anthracene	ND		0.021	0.0082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1

Client Sample ID: B55-PDI-07 (13-14)

Date Collected: 11/13/20 09:35 Date Collected is 11/11/20
Date Received: 11/14/20 10:05 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-3

Matrix: Soil
Percent Solids: 80.5

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzo[b]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzo[g,h,i]perylene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzo[k]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Bis(2-chloroethoxy)methane	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Bis(2-chloroethyl)ether	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Bis(2-ethylhexyl) phthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Butylbenzylphthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Caprolactam	ND		0.21	0.041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Carbazole	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Chrysene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Di-n-butyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Di-n-octyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Dibenz(a,h)anthracene	ND		0.021	0.0082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Dibenzofuran	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Diethyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Dimethyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Chloroaniline	ND		0.21	0.041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Fluorene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
4-Chlorophenyl-phenyl ether	ND		0.053	0.025	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Hexachlorobenzene	ND		0.021	0.0082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Hexachlorobutadiene	ND		0.094	0.045	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Hexachlorocyclopentadiene	ND		0.62	0.25	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Hexachloroethane	ND		0.21	0.041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Isophorone	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
N-Nitrosodi-n-propylamine	ND		0.062	0.029	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
N-Nitrosodiphenylamine	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Naphthalene	**0.0088**	J	0.021	0.0082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Nitrobenzene	ND		0.082	0.033	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Phenanthrene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Aniline	ND		0.62	0.21	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Phenol	ND		0.045	0.021	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Pyrene	ND		0.021	0.0041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Pentachlorophenol	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Benzyl alcohol	ND		0.62	0.21	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
n,n'-Dimethylaniline	ND		0.21	0.041	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Pyridine	ND		0.21	0.082	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
Triethylamine	ND	J	6.2	2.1	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1
1,4-Dioxane	ND		0.41	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 15:50	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.43*	*J B* R	*mg/Kg*	☼	*1.77*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Furan, 2,5-dimethyl-	*0.18*	*J N*	*mg/Kg*	☼	*2.28*	*625-86-5*	*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*1.2*	*J B* N	*mg/Kg*	☼	*3.90*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
2-Cyclohexen-1-one	*0.53*	*J N*	*mg/Kg*	☼	*4.82*	*930-68-7*	*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*1.6*	*J* N	*mg/Kg*	☼	*8.32*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.86*	*J* N	*mg/Kg*	☼	*8.40*		*11/18/20 16:18*	*11/24/20 15:50*	*1*
Unknown	*0.43*	*J* N	*mg/Kg*	☼	*8.57*		*11/18/20 16:18*	*11/24/20 15:50*	*1*

Client Sample ID: B55-PDI-07 (13-14)

Lab Sample ID: 410-20914-3

Date Collected: 11/13/20 09:35 Date Collected is 11/11/20
Date Received: 11/14/20 10:05 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 80.5

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Cyclohexanamine, N-cyclohexyl-N-methyl-	1.2	T J N	mg/Kg	☼	8.60	7560-83-0	11/18/20 16:18	11/24/20 15:50	1
Unknown	0.76	T J N	mg/Kg	☼	8.81		11/18/20 16:18	11/24/20 15:50	1
Unknown	0.93	T J N	mg/Kg	☼	8.86		11/18/20 16:18	11/24/20 15:50	1
Unknown	0.51	T J N	mg/Kg	☼	8.91		11/18/20 16:18	11/24/20 15:50	1
Unknown	0.30	T J N	mg/Kg	☼	9.40		11/18/20 16:18	11/24/20 15:50	1
Unknown	0.36	T J N	mg/Kg	☼	10.09		11/18/20 16:18	11/24/20 15:50	1
Unknown	0.23	T J N	mg/Kg	☼	11.05		11/18/20 16:18	11/24/20 15:50	1
Unknown	0.40	T J N	mg/Kg	☼	11.11		11/18/20 16:18	11/24/20 15:50	1
Cyclic octaatomic sulfur	0.92	T J N	mg/Kg	☼	11.18	10544-50-0	11/18/20 16:18	11/24/20 15:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	103		45 - 108	11/18/20 16:18	11/24/20 15:50	1
Nitrobenzene-d5 (Surr)	76		32 - 97	11/18/20 16:18	11/24/20 15:50	1
2-Fluorophenol (Surr)	86		26 - 96	11/18/20 16:18	11/24/20 15:50	1
2-Fluorobiphenyl (Surr)	85		39 - 100	11/18/20 16:18	11/24/20 15:50	1
2,4,6-Tribromophenol (Surr)	92		13 - 121	11/18/20 16:18	11/24/20 15:50	1
Phenol-d5 (Surr)	94		27 - 104	11/18/20 16:18	11/24/20 15:50	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	18	D	12	4.1	mg/Kg	☼	11/18/20 16:18	11/25/20 19:12	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	85		45 - 108	11/18/20 16:18	11/25/20 19:12	5
Nitrobenzene-d5 (Surr)	67		32 - 97	11/18/20 16:18	11/25/20 19:12	5
2-Fluorophenol (Surr)	76		26 - 96	11/18/20 16:18	11/25/20 19:12	5
2-Fluorobiphenyl (Surr)	76		39 - 100	11/18/20 16:18	11/25/20 19:12	5
2,4,6-Tribromophenol (Surr)	71		13 - 121	11/18/20 16:18	11/25/20 19:12	5
Phenol-d5 (Surr)	81		27 - 104	11/18/20 16:18	11/25/20 19:12	5

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	0.048	J	0.062	0.031	mg/Kg	☼	11/17/20 17:30	11/18/20 23:41	1
Formaldehyde	0.27		0.093	0.031	mg/Kg	☼	11/17/20 17:30	11/18/20 23:41	1
Glutaraldehyde	ND		0.062	0.031	mg/Kg	☼	11/17/20 17:30	11/18/20 23:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	117		77 - 133	11/17/20 17:30	11/18/20 23:41	1

Client Sample ID: B55-PDI-11 (5-6)

Lab Sample ID: 410-20914-4

Date Collected: 11/13/20 09:30 Date Collected is 11/12/20
Date Received: 11/14/20 10:05 Date Recorded Here is the Sample Shipment Date

Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	15.3		1.0	1.0	%			11/16/20 20:10	1

Client Sample ID: B55-PDI-11 (5-6)
Lab Sample ID: 410-20914-4

Date Collected: 11/13/20 09:30 Date Collected is 11/12/20
Date Received: 11/14/20 10:05 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.7

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
trans-1,3-Dichloropropene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Ethylbenzene	**0.12**	**J**	0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Styrene	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,4-Dichlorobenzene	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2-Dibromoethane	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2-Dichloroethane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
4-Methyl-2-pentanone	ND		0.52	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Methylcyclohexane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Toluene	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Chlorobenzene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2,4-Trimethylbenzene	**2.9**		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Cyclohexane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2,4-Trichlorobenzene	ND		0.52	0.26	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,4-Dioxane	ND		13	1.9	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Dibromochloromethane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Tetrachloroethene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
cis-1,2-Dichloroethene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
trans-1,2-Dichloroethene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Methyl tertiary butyl ether	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
m&p-Xylene	**0.059**	**J**	0.26	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,3,5-Trimethylbenzene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,3-Dichlorobenzene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Carbon tetrachloride	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
2-Hexanone	ND		0.52	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Acetone	ND		1.0	0.31	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Chloroform	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Benzene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,1,1-Trichloroethane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Bromomethane	ND		0.26	0.037	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Chloromethane	ND	J	0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Bromochloromethane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Chloroethane	ND		0.26	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Vinyl chloride	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Methylene Chloride	ND		0.26	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Carbon disulfide	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Bromoform	ND	*	0.52	0.26	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Bromodichloromethane	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,1-Dichloroethane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,1-Dichloroethene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Trichlorofluoromethane	ND		0.26	0.037	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Dichlorodifluoromethane	ND		0.26	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Freon 113	ND		0.52	0.031	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2-Dichloropropane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
2-Butanone	ND	J	0.52	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,1,2-Trichloroethane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
2-Nitropropane	~~ND~~	~~*~~ R	0.52	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Trichloroethene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Methyl acetate	ND		0.26	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50

Client Sample ID: B55-PDI-11 (5-6)
Lab Sample ID: 410-20914-4

Date Collected: 11/13/20 09:30 Date Collected is 11/12/20
Date Received: 11/14/20 10:05 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.7

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2,3-Trichlorobenzene	ND		0.52	0.26	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
o-Xylene	ND		0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2-Dichlorobenzene	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
1,2-Dibromo-3-Chloropropane	ND		0.26	0.026	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Acetonitrile	ND		5.2	1.3	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Isopropylbenzene	**0.23**	**J**	0.26	0.021	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Chlorodifluoromethane	ND		0.52	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Cyclohexanone	ND		13	1.3	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Ethyl acetate	ND		0.26	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Ethyl ether	ND		0.26	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Isobutyl alcohol	ND		13	2.0	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Naphthalene	ND		0.26	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
n-Butanol	ND		13	2.9	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
n-Butylbenzene	**1.7**		0.42	0.16	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
n-Heptane	ND		0.42	0.16	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
p-Isopropyltoluene	**0.43**		0.26	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
sec-Butylbenzene	**0.71**		0.26	0.10	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
t-Butyl alcohol	ND		5.2	0.78	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
tert-Butylbenzene	ND		0.26	0.042	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Tetrahydrofuran	ND		0.42	0.052	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50
Xylenes, Total	ND		0.52	0.073	mg/Kg	☼	11/14/20 16:23	11/23/20 03:24	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*3.2*	*T J N*	*mg/Kg*	☼	*11.12*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*2.9*	*T J N*	*mg/Kg*	☼	*11.23*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*3.6*	*T J N*	*mg/Kg*	☼	*11.87*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Nonane, 3-methyl-	*2.4*	*T J N*	*mg/Kg*	☼	*11.99*	*5911-04-6*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*2.4*	*T J N*	*mg/Kg*	☼	*12.05*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*4.1*	*T J N*	*mg/Kg*	☼	*12.22*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Benzene, 2-ethyl-1,3-dimethyl-	*2.8*	*T J N*	*mg/Kg*	☼	*13.68*	*2870-04-4*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
Benzene, 1,2,4,5-tetramethyl-	*3.0*	*T J N*	*mg/Kg*	☼	*13.96*	*95-93-2*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*2.7*	*T J N*	*mg/Kg*	☼	*14.28*		*11/14/20 16:23*	*11/23/20 03:24*	*50*
Unknown	*3.9*	*T J N*	*mg/Kg*	☼	*14.51*		*11/14/20 16:23*	*11/23/20 03:24*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*54 - 135*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
4-Bromofluorobenzene (Surr)	*127*		*50 - 131*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
Dibromofluoromethane (Surr)	*95*		*50 - 141*	*11/14/20 16:23*	*11/23/20 03:24*	*50*
Toluene-d8 (Surr)	*103*		*52 - 141*	*11/14/20 16:23*	*11/23/20 03:24*	*50*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
1,2,4,5-Tetrachlorobenzene	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,2'-oxybis[1-chloropropane]	ND		0.050	0.023	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,3,4,6-Tetrachlorophenol	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4,5-Trichlorophenol	ND		0.077	0.035	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4,6-Trichlorophenol	ND		0.066	0.031	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4-Dichlorophenol	ND		0.050	0.023	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1

Client Sample ID: B55-PDI-11 (5-6)

Lab Sample ID: 410-20914-4

Date Collected: 11/13/20 09:30
Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date
Matrix: Soil

Date Received: 11/14/20 10:05
Percent Solids: 84.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dimethylphenol	ND		0.077	0.035	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4-Dinitrophenol	ND		1.2	0.39	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,4-Dinitrotoluene	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2,6-Dinitrotoluene	ND		0.058	0.027	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Chloronaphthalene	ND		0.039	0.0077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Chlorophenol	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Methylnaphthalene	ND		0.039	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Methylphenol	ND		0.077	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Nitroaniline	ND		0.058	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
2-Nitrophenol	ND		0.066	0.031	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
3,3'-Dichlorobenzidine	ND		0.39	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
3-Nitroaniline	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4,6-Dinitro-2-methylphenol	ND		0.58	0.27	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Bromophenyl-phenylether	ND		0.058	0.027	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Chloro-3-methylphenol	ND		0.058	0.027	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
3,4-Methylphenol	ND		0.058	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Nitroaniline	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Nitrophenol	ND		0.58	0.19	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Acenaphthene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Acenaphthylene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Acetophenone	ND		0.058	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Anthracene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Atrazine	ND		0.50	0.23	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzaldehyde	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzo[a]anthracene	ND		0.019	0.0077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzo[a]pyrene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzo[b]fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzo[g,h,i]perylene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzo[k]fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Bis(2-chloroethoxy)methane	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Bis(2-chloroethyl)ether	ND		0.058	0.027	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Bis(2-ethylhexyl) phthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Butylbenzylphthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Caprolactam	ND		0.19	0.039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Carbazole	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Chrysene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Di-n-butyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Di-n-octyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Dibenz(a,h)anthracene	ND		0.019	0.0077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Dibenzofuran	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Diethyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Dimethyl phthalate	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Fluoranthene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Chloroaniline	ND		0.19	0.039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Fluorene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
4-Chlorophenyl-phenyl ether	ND		0.050	0.023	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Hexachlorobenzene	ND		0.019	0.0077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Hexachlorobutadiene	ND		0.089	0.043	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Hexachlorocyclopentadiene	ND		0.58	0.23	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1

Client Sample ID: B55-PDI-11 (5-6)

Date Collected: 11/13/20 09:30 Date Collected is 11/12/20
Date Received: 11/14/20 10:05 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-20914-4

Matrix: Soil
Percent Solids: 84.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachloroethane	ND		0.19	0.039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Indeno[1,2,3-cd]pyrene	ND		0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Isophorone	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
N-Nitrosodi-n-propylamine	ND		0.058	0.027	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
N-Nitrosodiphenylamine	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Naphthalene	ND		0.019	0.0077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Nitrobenzene	ND		0.077	0.031	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Phenanthrene	**0.0086**	**J**	0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Aniline	ND		0.58	0.19	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Phenol	ND		0.043	0.019	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Pyrene	**0.0069**	**J**	0.019	0.0039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Pentachlorophenol	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Benzyl alcohol	ND		0.58	0.19	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Dicyclohexylamine	**1.7**	**J**	2.3	0.77	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
n,n'-Dimethylaniline	ND		0.19	0.039	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Pyridine	ND		0.19	0.077	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
Triethylamine	ND	J	5.8	1.9	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1
1,4-Dioxane	ND		0.39	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 16:15	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.76*	*T J B R*	*mg/Kg*	☼	*1.78*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.52*	*T J B R*	*mg/Kg*	☼	*3.90*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Dodecane, 2,6,11-trimethyl-	*0.41*	*T J N*	*mg/Kg*	☼	*5.68*	*31295-56-4*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Benzene, 1,3-diethyl-	*0.33*	*T J N*	*mg/Kg*	☼	*5.79*	*141-93-5*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.34*	*T J N*	*mg/Kg*	☼	*5.86*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.37*	*T J N*	*mg/Kg*	☼	*5.93*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Benzene, 2-ethyl-1,4-dimethyl-	*0.38*	*T J N*	*mg/Kg*	☼	*6.00*	*1758-88-9*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.36*	*T J N*	*mg/Kg*	☼	*6.24*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Benzene, 1,2,3,4-tetramethyl-	*0.36*	*T J N*	*mg/Kg*	☼	*6.29*	*488-23-3*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Benzene, 1,2,3,5-tetramethyl-	*0.52*	*T J N*	*mg/Kg*	☼	*6.31*	*527-53-7*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Benzene, 1-methyl-4-(1-methylpropyl)-	*0.43*	*T J N*	*mg/Kg*	☼	*6.41*	*1595-16-0*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.78*	*T J N*	*mg/Kg*	☼	*6.53*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Benzene, 1-methyl-3-(1-methylethyl)-	*0.52*	*T J N*	*mg/Kg*	☼	*6.57*	*535-77-3*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.51*	*T J N*	*mg/Kg*	☼	*6.62*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.80*	*T J N*	*mg/Kg*	☼	*6.81*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.45*	*T J N*	*mg/Kg*	☼	*6.88*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.36*	*T J N*	*mg/Kg*	☼	*6.94*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.33*	*T J N*	*mg/Kg*	☼	*6.97*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
1H-Indene, 2,3-dihydro-4,7-dimethyl-	*0.36*	*T J N*	*mg/Kg*	☼	*7.16*	*6682-71-9*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.48*	*T J N*	*mg/Kg*	☼	*8.41*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.75*	*T J N*	*mg/Kg*	☼	*8.81*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*1.2*	*T J N*	*mg/Kg*	☼	*9.77*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*0.40*	*T J N*	*mg/Kg*	☼	*10.10*		*11/18/20 16:18*	*11/24/20 16:15*	*1*
Cyclic octaatomic sulfur	*1.3*	*T J N*	*mg/Kg*	☼	*11.11*	*10544-50-0*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Unknown	*1.1*	*T J N*	*mg/Kg*	☼	*11.18*		*11/18/20 16:18*	*11/24/20 16:15*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*101*		*45 - 108*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Nitrobenzene-d5 (Surr)	*73*		*32 - 97*	*11/18/20 16:18*	*11/24/20 16:15*	*1*

Client Sample ID: B55-PDI-11 (5-6)

Lab Sample ID: 410-20914-4

Date Collected: 11/13/20 09:30 Date Collected is 11/12/20
Date Received: 11/14/20 10:05 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*81*		*26 - 96*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
2-Fluorobiphenyl (Surr)	*84*		*39 - 100*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
2,4,6-Tribromophenol (Surr)	*92*		*13 - 121*	*11/18/20 16:18*	*11/24/20 16:15*	*1*
Phenol-d5 (Surr)	*85*		*27 - 104*	*11/18/20 16:18*	*11/24/20 16:15*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.059	0.030	mg/Kg	☼	11/17/20 17:30	11/18/20 23:53	1
Formaldehyde	**0.47**		0.089	0.030	mg/Kg	☼	11/17/20 17:30	11/18/20 23:53	1
Glutaraldehyde	ND		0.059	0.030	mg/Kg	☼	11/17/20 17:30	11/18/20 23:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*113*		*77 - 133*	*11/17/20 17:30*	*11/18/20 23:53*	*1*

Client Sample ID: EB11132020

Lab Sample ID: 410-20914-5

Date Collected: 11/13/20 07:00
Date Received: 11/14/20 10:05

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
1,2,4,5-Tetrachlorobenzene	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,2'-oxybis[1-chloropropane]	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,3,4,6-Tetrachlorophenol	ND		11	4.4	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4,5-Trichlorophenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4,6-Trichlorophenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4-Dichlorophenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4-Dimethylphenol	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4-Dinitrophenol	ND		33	15	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,4-Dinitrotoluene	ND		5.5	1.1	ug/L		11/20/20 09:00	12/02/20 14:50	1
2,6-Dinitrotoluene	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Chloronaphthalene	ND		1.1	0.44	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Chlorophenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Methylnaphthalene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Methylphenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Nitroaniline	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
2-Nitrophenol	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
3,3'-Dichlorobenzidine	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
3-Nitroaniline	ND		7.7	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
4,6-Dinitro-2-methylphenol	ND		23	8.7	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Bromophenyl-phenylether	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Chloro-3-methylphenol	ND		3.8	1.7	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Chloroaniline	ND		11	4.4	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Chlorophenyl-phenyl ether	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
3,4-Methylphenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Nitroaniline	ND		3.3	0.98	ug/L		11/20/20 09:00	12/02/20 14:50	1
4-Nitrophenol	ND		33	11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Acenaphthene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Acenaphthylene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Acetophenone	ND		11	4.4	ug/L		11/20/20 09:00	12/02/20 14:50	1

Client Sample ID: EB11132020

Date Collected: 11/13/20 07:00
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-5

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aniline	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
Anthracene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Atrazine	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzaldehyde	ND		11	3.3	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzo[a]anthracene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzo[a]pyrene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzo[b]fluoranthene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzo[g,h,i]perylene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzo[k]fluoranthene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Benzyl alcohol	ND		33	11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Butylbenzylphthalate	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Caprolactam	ND		12	5.5	ug/L		11/20/20 09:00	12/02/20 14:50	1
Carbazole	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Chrysene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Di-n-butyl phthalate	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Di-n-octyl phthalate	ND		12	5.5	ug/L		11/20/20 09:00	12/02/20 14:50	1
Dibenz(a,h)anthracene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Dibenzofuran	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Dicyclohexylamine	ND		22	11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Diethyl phthalate	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Dimethyl phthalate	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Fluoranthene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Fluorene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Hexachlorobenzene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Hexachlorobutadiene	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Hexachlorocyclopentadiene	ND	** J	12	5.5	ug/L		11/20/20 09:00	12/02/20 14:50	1
Hexachloroethane	ND		5.5	1.1	ug/L		11/20/20 09:00	12/02/20 14:50	1
Indeno[1,2,3-cd]pyrene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Isophorone	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
n,n'-Dimethylaniline	ND		1.1	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
N-Nitrosodi-n-propylamine	ND		3.3	0.77	ug/L		11/20/20 09:00	12/02/20 14:50	1
N-Nitrosodiphenylamine	ND		3.3	0.77	ug/L		11/20/20 09:00	12/02/20 14:50	1
Naphthalene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Nitrobenzene	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Pentachlorophenol	ND		5.5	1.1	ug/L		11/20/20 09:00	12/02/20 14:50	1
Phenanthrene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Phenol	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Pyrene	ND		0.55	0.11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Pyridine	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1
Triethylamine	ND		11	11	ug/L		11/20/20 09:00	12/02/20 14:50	1
Bis(2-chloroethoxy)methane	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Bis(2-chloroethyl)ether	ND		2.2	0.55	ug/L		11/20/20 09:00	12/02/20 14:50	1
Bis(2-ethylhexyl) phthalate	ND		12	5.5	ug/L		11/20/20 09:00	12/02/20 14:50	1
1,4-Dioxane	ND		5.5	2.2	ug/L		11/20/20 09:00	12/02/20 14:50	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*11/20/20 09:00*	*12/02/20 14:50*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*82*		*10 - 150*	*11/20/20 09:00*	*12/02/20 14:50*	*1*

Client Sample ID: EB11132020
Lab Sample ID: 410-20914-5
Date Collected: 11/13/20 07:00
Matrix: Water
Date Received: 11/14/20 10:05

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*71*		*44 - 102*	*11/20/20 09:00*	*12/02/20 14:50*	*1*
2-Fluorophenol (Surr)	*49*		*10 - 84*	*11/20/20 09:00*	*12/02/20 14:50*	*1*
Nitrobenzene-d5 (Surr)	*74*		*23 - 128*	*11/20/20 09:00*	*12/02/20 14:50*	*1*
p-Terphenyl-d14 (Surr)	*84*		*31 - 113*	*11/20/20 09:00*	*12/02/20 14:50*	*1*
Phenol-d5 (Surr)	*38*		*10 - 67*	*11/20/20 09:00*	*12/02/20 14:50*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/16/20 17:00	11/19/20 01:01	1
Formaldehyde	ND		50	20	ug/L		11/16/20 17:00	11/19/20 01:01	1
Glutaraldehyde	ND		50	30	ug/L		11/16/20 17:00	11/19/20 01:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*94*		*39 - 153*	*11/16/20 17:00*	*11/19/20 01:01*	*1*

Client Sample ID: B55-PDI-SB-15 (8-9)
Lab Sample ID: 410-20914-6
Date Collected: 11/13/20 13:15
Matrix: Soil
Date Received: 11/14/20 10:05

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**16.4**		1.0	1.0	%			11/16/20 20:10	1

Client Sample ID: B55-PDI-SB-15 (8-9)
Lab Sample ID: 410-20914-6
Date Collected: 11/13/20 13:15
Matrix: Soil
Date Received: 11/14/20 10:05
Percent Solids: 83.6

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,1,2,2-Tetrachloroethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,1,2-Trichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,1-Dichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,1-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2,3-Trichlorobenzene	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2,4-Trichlorobenzene	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2,4-Trimethylbenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2-Dibromo-3-Chloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2-Dibromoethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2-Dichloroethane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,2-Dichloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,3,5-Trimethylbenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,3-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,4-Dichlorobenzene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
1,4-Dioxane	ND		0.20	0.029	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
2-Butanone	**0.0038**	**J**	0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
2-Hexanone	ND		0.0079	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
2-Nitropropane	ND		0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
4-Methyl-2-pentanone	ND		0.0079	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1

Client Sample ID: B55-PDI-SB-15 (8-9)
Date Collected: 11/13/20 13:15
Date Received: 11/14/20 10:05

Lab Sample ID: 410-20914-6
Matrix: Soil
Percent Solids: 83.6

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**0.080**		0.016	0.0047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Acetonitrile	ND		0.079	0.020	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Benzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Bromochloromethane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Bromodichloromethane	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Bromoform	ND		0.0079	0.0040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Bromomethane	ND		0.0040	0.00055	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Carbon disulfide	**0.00098**	**J**	0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Carbon tetrachloride	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Chlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Chlorodifluoromethane	ND		0.0079	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Chloroethane	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Chloroform	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Chloromethane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
cis-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
cis-1,3-Dichloropropene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Cyclohexane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Cyclohexanone	**2.2**		0.20	0.020	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Dibromochloromethane	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Dichlorodifluoromethane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Ethyl acetate	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Ethyl ether	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Ethylbenzene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Freon 113	ND		0.0079	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Isobutyl alcohol	ND		0.20	0.030	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Isopropylbenzene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
m&p-Xylene	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Methyl acetate	ND		0.0040	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Methyl tertiary butyl ether	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Methylcyclohexane	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Methylene Chloride	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Naphthalene	**0.0021**	**J**	0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
n-Butanol	ND		0.20	0.044	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
n-Butylbenzene	ND		0.0063	0.0024	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
n-Heptane	ND		0.0063	0.0024	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
o-Xylene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
p-Isopropyltoluene	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
sec-Butylbenzene	ND		0.0040	0.0016	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Styrene	ND		0.0040	0.00032	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
t-Butyl alcohol	**0.044**	**J**	0.079	0.012	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
tert-Butylbenzene	ND		0.0040	0.00063	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Tetrachloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Tetrahydrofuran	ND		0.0063	0.00079	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Toluene	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
trans-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
trans-1,3-Dichloropropene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Trichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Trichlorofluoromethane	ND		0.0040	0.00055	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1
Vinyl chloride	ND		0.0040	0.00047	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1

Client Sample ID: B55-PDI-SB-15 (8-9)
Lab Sample ID: 410-20914-6

Date Collected: 11/13/20 13:15
Matrix: Soil

Date Received: 11/14/20 10:05
Percent Solids: 83.6

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	ND		0.0079	0.0011	mg/Kg	☼	11/14/20 16:21	11/24/20 15:34	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.12*	*T J N*	*mg/Kg*	☼	*5.22*		*11/14/20 16:21*	*11/24/20 15:34*	*1*
Hexane, 2,5-dimethyl-	*0.17*	*T J N*	*mg/Kg*	☼	*6.00*	*592-13-2*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Hexane, 2,4-dimethyl-	*0.074*	*T J N*	*mg/Kg*	☼	*6.06*	*589-43-5*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Cyclopentane, 1,2,4-trimethyl-	*0.11*	*T J N*	*mg/Kg*	☼	*6.26*	*2815-58-9*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Unknown	*0.11*	*T J N*	*mg/Kg*	☼	*8.06*		*11/14/20 16:21*	*11/24/20 15:34*	*1*
Cyclohexane, 1,2,4-trimethyl-	*0.098*	*T J N*	*mg/Kg*	☼	*8.24*	*2234-75-5*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Unknown	*0.14*	*T J N*	*mg/Kg*	☼	*9.11*		*11/14/20 16:21*	*11/24/20 15:34*	*1*
Unknown	*0.18*	*T J N*	*mg/Kg*	☼	*9.17*		*11/14/20 16:21*	*11/24/20 15:34*	*1*
Cyclopentanone, 2-methyl-3-(1-methylethyl)-	*0.15*	*T J N*	*mg/Kg*	☼	*9.24*	*54549-81-4*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Unknown	*0.10*	*T J N*	*mg/Kg*	☼	*9.34*		*11/14/20 16:21*	*11/24/20 15:34*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*54 - 135*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
4-Bromofluorobenzene (Surr)	*99*		*50 - 131*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/14/20 16:21*	*11/24/20 15:34*	*1*
Toluene-d8 (Surr)	*92*		*52 - 141*	*11/14/20 16:21*	*11/24/20 15:34*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
1,2,4,5-Tetrachlorobenzene	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,2'-oxybis[1-chloropropane]	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4,5-Trichlorophenol	ND		0.080	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4,6-Trichlorophenol	ND		0.068	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4-Dichlorophenol	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4-Dimethylphenol	ND		0.080	0.036	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4-Dinitrophenol	ND		1.2	0.40	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,4-Dinitrotoluene	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2,6-Dinitrotoluene	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Chloronaphthalene	ND		0.040	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Chlorophenol	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Methylnaphthalene	ND		0.040	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Methylphenol	ND		0.080	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Nitroaniline	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
2-Nitrophenol	ND		0.068	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
3,3'-Dichlorobenzidine	ND		0.40	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
3-Nitroaniline	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4,6-Dinitro-2-methylphenol	ND		0.60	0.28	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Bromophenyl-phenylether	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Chloro-3-methylphenol	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
3,4-Methylphenol	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Nitroaniline	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Nitrophenol	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Acenaphthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Acenaphthylene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1

Client Sample ID: B55-PDI-SB-15 (8-9)
Lab Sample ID: 410-20914-6

Date Collected: 11/13/20 13:15
Matrix: Soil

Date Received: 11/14/20 10:05
Percent Solids: 83.6

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetophenone	ND		0.060	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Anthracene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Atrazine	ND		0.52	0.24	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzaldehyde	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzo[a]anthracene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzo[a]pyrene	**0.0061**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzo[b]fluoranthene	**0.0058**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzo[g,h,i]perylene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzo[k]fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Bis(2-chloroethoxy)methane	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Bis(2-chloroethyl)ether	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Butylbenzylphthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Caprolactam	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Carbazole	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Chrysene	**0.0052**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Di-n-butyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Di-n-octyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Dibenz(a,h)anthracene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Dibenzofuran	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Diethyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Dimethyl phthalate	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Fluoranthene	**0.013**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Chloroaniline	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Fluorene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
4-Chlorophenyl-phenyl ether	ND		0.052	0.024	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Hexachlorobenzene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Hexachlorobutadiene	ND		0.091	0.044	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Hexachlorocyclopentadiene	ND		0.60	0.24	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Hexachloroethane	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Isophorone	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
N-Nitrosodi-n-propylamine	ND		0.060	0.028	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
N-Nitrosodiphenylamine	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Naphthalene	ND		0.020	0.0080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Nitrobenzene	ND		0.080	0.032	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Phenanthrene	**0.0040**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Aniline	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Phenol	ND		0.044	0.020	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Pyrene	**0.0099**	**J**	0.020	0.0040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Pentachlorophenol	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Benzyl alcohol	ND		0.60	0.20	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
n,n'-Dimethylaniline	ND		0.20	0.040	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Pyridine	ND		0.20	0.080	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
Triethylamine	ND	* J	6.0	2.0	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1
1,4-Dioxane	ND		0.40	0.12	mg/Kg	☼	11/18/20 16:18	11/24/20 16:39	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.27*	*TJ N*	*mg/Kg*	☼	*3.25*		*11/18/20 16:18*	*11/24/20 16:39*	*1*
Unknown	*1.2*	*TJB N*	*mg/Kg*	☼	*3.90*		*11/18/20 16:18*	*11/24/20 16:39*	*1*

Client Sample ID: B55-PDI-SB-15 (8-9)
Lab Sample ID: 410-20914-6

Date Collected: 11/13/20 13:15
Matrix: Soil

Date Received: 11/14/20 10:05
Percent Solids: 83.6

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	0.20	T J N	mg/Kg	☼	4.81		11/18/20 16:18	11/24/20 16:39	1
Unknown	0.72	T J N	mg/Kg	☼	8.25		11/18/20 16:18	11/24/20 16:39	1
Unknown	0.69	T J N	mg/Kg	☼	8.33		11/18/20 16:18	11/24/20 16:39	1
Unknown	0.25	T J N	mg/Kg	☼	8.39		11/18/20 16:18	11/24/20 16:39	1
Cyclohexanamine, N-cyclohexyl-N-methyl-	0.52	T J N	mg/Kg	☼	8.61	7560-83-0	11/18/20 16:18	11/24/20 16:39	1
Unknown	0.56	T J N	mg/Kg	☼	8.78		11/18/20 16:18	11/24/20 16:39	1
Unknown	0.33	T J N	mg/Kg	☼	10.09		11/18/20 16:18	11/24/20 16:39	1
Cyclic octaatomic sulfur	0.27	T J N	mg/Kg	☼	11.17	10544-50-0	11/18/20 16:18	11/24/20 16:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	98		45 - 108	11/18/20 16:18	11/24/20 16:39	1
Nitrobenzene-d5 (Surr)	69		32 - 97	11/18/20 16:18	11/24/20 16:39	1
2-Fluorophenol (Surr)	78		26 - 96	11/18/20 16:18	11/24/20 16:39	1
2-Fluorobiphenyl (Surr)	79		39 - 100	11/18/20 16:18	11/24/20 16:39	1
2,4,6-Tribromophenol (Surr)	78		13 - 121	11/18/20 16:18	11/24/20 16:39	1
Phenol-d5 (Surr)	82		27 - 104	11/18/20 16:18	11/24/20 16:39	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**5.0**	D	4.8	1.6	mg/Kg	☼	11/18/20 16:18	11/25/20 19:37	2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	86		45 - 108	11/18/20 16:18	11/25/20 19:37	2
Nitrobenzene-d5 (Surr)	62		32 - 97	11/18/20 16:18	11/25/20 19:37	2
2-Fluorophenol (Surr)	69		26 - 96	11/18/20 16:18	11/25/20 19:37	2
2-Fluorobiphenyl (Surr)	69		39 - 100	11/18/20 16:18	11/25/20 19:37	2
2,4,6-Tribromophenol (Surr)	63		13 - 121	11/18/20 16:18	11/25/20 19:37	2
Phenol-d5 (Surr)	72		27 - 104	11/18/20 16:18	11/25/20 19:37	2

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	**0.059**	J	0.060	0.030	mg/Kg	☼	11/17/20 17:30	11/19/20 00:04	1
Formaldehyde	**0.39**		0.090	0.030	mg/Kg	☼	11/17/20 17:30	11/19/20 00:04	1
Glutaraldehyde	ND		0.060	0.030	mg/Kg	☼	11/17/20 17:30	11/19/20 00:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	109		77 - 133	11/17/20 17:30	11/19/20 00:04	1

ARCADIS Design & Consultancy for natural and built assets

Bristol-Myers Squibb

Thompson Road Investigation

Data Usability Summary Report

Syracuse, NY

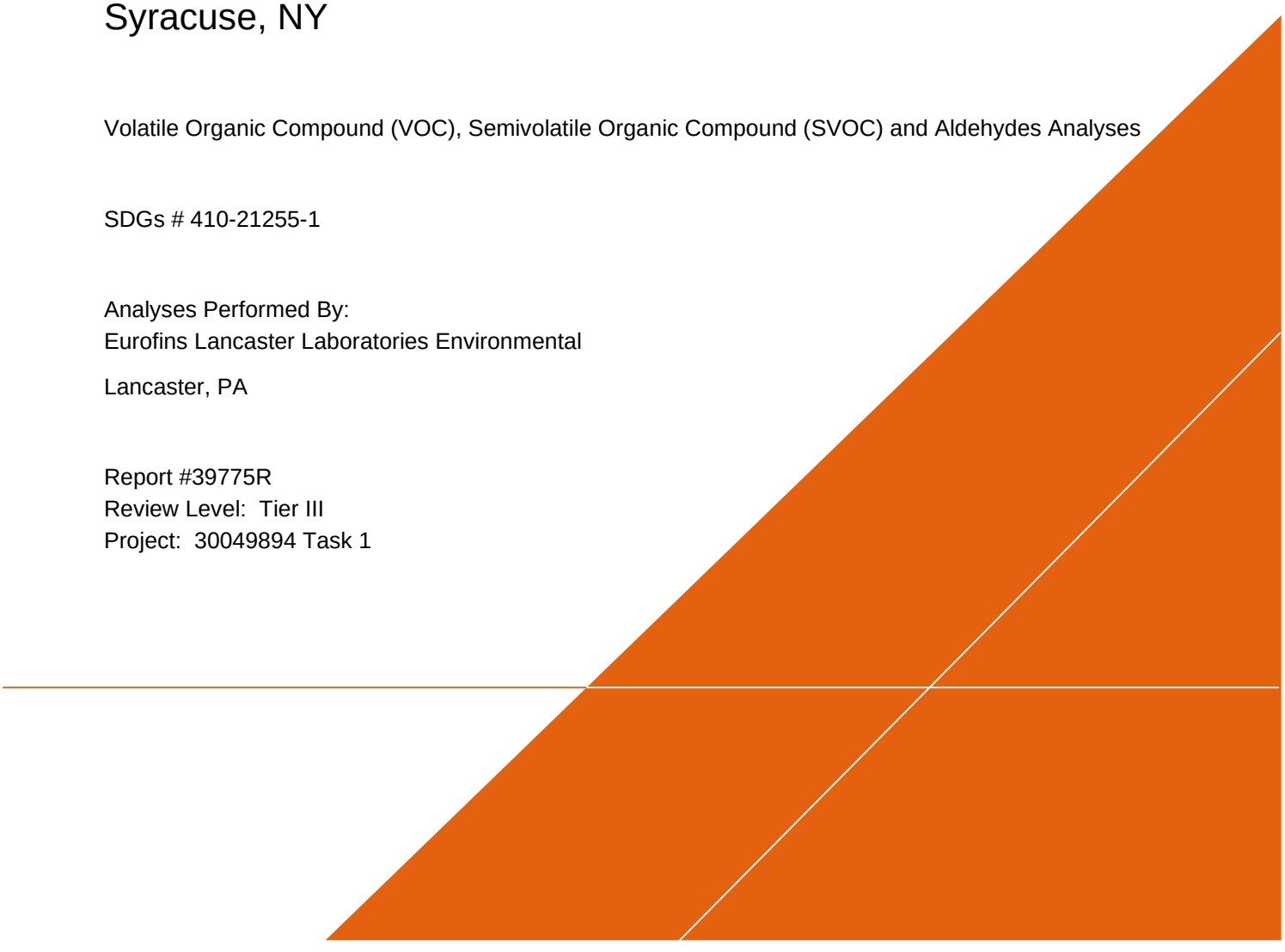
Volatile Organic Compound (VOC), Semivolatile Organic Compound (SVOC) and Aldehydes Analyses

SDGs # 410-21255-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental

Lancaster, PA

Report #39775R
Review Level: Tier III
Project: 30049894 Task 1



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # 410-21255-1 for samples collected in association with the with the Bristol-Myers Squibb Thompson Road Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PFAS	MET	ALD
410-21255-1	B55-PDI-SB-21 11172020	410-21255-1	Water	11/17/2020		X	X			X
	B55-PDI-SB-17 (9-10) 11172020	410-21255-2	Soil	11/17/2020	Date Collected is 11/16/20	X	X			X
	B55-PDI-SB-19 (11.6-12.6) 11172020	410-21255-3	Soil	11/17/2020		X	X			X
	B55-PDI-SB-18 (10.7-11.7) 11172020	410-21255-4	Soil	11/17/2020		X	X			X
	B55-PDI-SB-19 (12.6-13.6) 11172020	410-21255-5	Soil	11/17/2020		X	X			X
	B55-PDI-SB-18 (9.5-10.5) 11172020	410-21255-6	Soil	11/17/2020		X	X			X
	B55-PDI-SB-21 (4.5-5.5) 11172020	410-21255-7	Soil	11/17/2020		X	X			X
	B55-PDI-SB-17 (8-9) 11172020	410-21255-8	Soil	11/17/2020	Date Collected is 11/16/20	X	X			X
	B55-PDI-SB-06 (12-13) 11172020	410-21255-9	Soil	11/17/2020	Date Collected is 11/11/20	X	X			X
	TB20083 11172020	410-21255-10	Water	11/17/2020		X	X			X

Notes:

1. Aldehydes include Acetaldehyde, Formaldehyde and Glutaraldehyde.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

List of Acronyms

%D: Percent Difference

%R: Percent Recovery

AC: Acceptable

ALC/GLY: Alcohols/Glycols

BAL: Blank Action Level

CCV: Continuing Calibration Verification

CRDL: Contract Required Detection Limit

D: Dilution

EIS: Extractable Internal Standard

FB: Field Blank

FD: Field Duplicate

ALD: Aldehydes

GC/ECD: Gas Chromatograph/Electron Capture Detector

GC/MS: Gas Chromatograph/Mass spectrometer

HT: Holding Time

ICP: Inductively Coupled Plasma

ICS: Interference Control Sample

ICV: Initial Calibration Verification

ISTD: Internal Standards

LabDup: Laboratory Duplicate

LCS: Lab Control Sample

LCSD: Lab Control Sample Duplicate

LL: Lower Control Limit

MB: Method Blank

MDL: Method Detection Limit

MET: Metals

MS: Matrix Spike

MSD: Matrix Spike Duplicate

N/A: Not Applicable

NC: Not Compliant

List of Acronyms, Continued

PAH: Polyaromatic Hydrocarbon

PCB: Polychlorinated Biphenyl

PEST: Pesticide

PFAS: Per- and Polyfluoroalkyl Substances

QA: Quality Assurance

QC: Quality Control

RB: Rinse Blank

RL: Reporting Limit

RPD: Relative Percent Difference

RRF: Relative Response Factor

RSD: Relative Standard Deviation

RT: Retention Time

SDG: Sample Delivery Group

SerDil: Serial Dilution

SIM: Single Ion Monitoring

SOP: Standard Operating Procedure

SSTD: Surrogate Standards

SVOC: Semivolatile Organic Compound

TB: Trip Blank

TIC: Tentatively Identified Compound

TOC: Total Organic Carbon

TOTDIS: Total and Dissolved

UL: Upper Control Limit

USEPA: United States Environmental Protection Agency

VOC: Volatile Organic Compound

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW846 methods 8260C, 8270D and 8315A. Data were reviewed in accordance with EPA 540-R-2017-002, January 2017 (with reference to the historical USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999, as appropriate.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.

- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260C	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.
	Soil	48 hours from collection to extraction and 14 days from extraction to analysis	Cool to <6 °C.

Note:

s.u. Standard units

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
B55-PDI-SB-21 (4.5-5.5) 11172020	Toluene (TB)	Detected sample results <RL and <BAL	"UB" at the RL

Note:

RL Reporting limit

TB Trip Blank

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
B55-PDI-SB-18 (9.5-10.5) 11172020 B55-PDI-SB-17 (8-9) 11172020	CCV %D	Bromodichloromethane	21.4%
		cis-1,3-Dichloropropene	22.0%
		2-Nitropropane	116.5%
		Bromoform	21.2%
B55-PDI-SB-21 11172020 TB20083 11172020	CCV %D	Dichlorodifluoromethane	22.7%
		Chloromethane	25.0%
		Vinyl chloride	20.9%
		Bromomethane	27.1%
		Chloroethane	28.7%

Sample Locations	Initial/Continuing	Compound	Criteria
		Trichlorofluoromethane	27.3%
B55-PDI-SB-17 (9-10) 11172020 B55-PDI-SB-19 (11.6-12.6) 11172020 B55-PDI-SB-18 (10.7-11.7) 11172020 B55-PDI-SB-19 (12.6-13.6) 11172020 B55-PDI-SB-21 (4.5-5.5) 11172020 B55-PDI-SB-06 (12-13) 11172020	CCV %D	1,4-Dioxane	33.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC

analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
B55-PDI-SB-21 11172020	Bromomethane	AC	>UL
	Chloroethane	AC	>UL
	Chloromethane	>UL	>UL
	Trichlorofluoromethane	>UL	AC
	Vinyl chloride	>UL	>UL
	Tetrachloroethene	AC	<LL but >10%

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ

Control Limit	Sample Result	Qualification
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than the control limit are presented in the following table.

Sample Locations	Compound
B55-PDI-SB-21 11172020	1,4-Dioxane
	Cyclohexane
	Freon 113
	n-Heptane

The criteria used to evaluate the RPD between the MS/MSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
B55-PDI-SB-18 (9.5-10.5) 11172020	Bromoform	>UL	>UL
B55-PDI-SB-17 (8-9) 11172020	2-Nitropropane	>UL	>UL

Sample Locations	Compound	LCS Recovery	LCSD Recovery
B55-PDI-SB-21 11172020 TB20083 11172020	Bromomethane	>UL	>UL
	Chloroethane	>UL	>UL
	Chloromethane	>UL	>UL
	Dichlorodifluoromethane	>UL	>UL
	Vinyl chloride	>UL	>UL

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with this SDG.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

Tentatively identified compounds (TICs) were identified in all sample locations associated with this SDG. VOC analysis requires that TICs be qualified as estimated (JN).

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
C. Trip blanks		X	X		
Laboratory Control Sample (LCS)		X	X		
Laboratory Control Sample Duplicate(LCSD)		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)		X	X		
Matrix Spike Duplicate(MSD)		X	X		
MS/MSD Precision (RPD)		X	X		
Field/Lab Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	

VOCs: SW-846 8260C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

SEMI-VOLATILE ORGANIC COMPOUND (SVOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270D	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Holding Time	Criteria
B55-PDI-SB-17 (9-10) 11172020 RE B55-PDI-SB-19 (11.6-12.6) 11172020 RE B55-PDI-SB-18 (10.7-11.7) 11172020 RE B55-PDI-SB-19 (12.6-13.6) 11172020 RE B55-PDI-SB-18 (9.5-10.5) 11172020 RE B55-PDI-SB-21 (4.5-5.5) 11172020 RE B55-PDI-SB-17 (8-9) 11172020 RE B55-PDI-SB-06 (12-13) 11172020 RE	Extraction Completed in 14 days	16 Days

Sample results associated with sample locations analyzed by analytical method SW-846 8270 were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

Please note the samples listed above were re-extracted and re-analyzed due to the low recoveries (below 10%) associated with the original LCS/LCSD for compounds Triethylamine, n,n-Dimethylanaline and Dicylcohexlamine. Therefore, results for these three compounds were reported from the re-extraction/re-

analysis and qualified as estimated due to the holding time deviation. All other results were reported from the original analysis.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
B55-PDI-SB-17 (8-9) 11172020	TIC Unknown RT: 3.86	Detected sample results less than 5 times blank result	R

Note:

RL Reporting limit

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
B55-PDI-SB-17 (9-10) 11172020 B55-PDI-SB-18 (10.7-11.7) 11172020 B55-PDI-SB-19 (12.6-13.6) 11172020 B55-PDI-SB-18 (9.5-10.5) 11172020 B55-PDI-SB-17 (8-9) 11172020	CCV %D	Benzo[a]anthracene	24.6%
		Benzo[b]fluoranthene	23.5%
B55-PDI-SB-19 (11.6-12.6) 11172020 B55-PDI-SB-06 (12-13) 11172020	CCV %D	Benzo[a]anthracene	20.1%
		Benzo[b]fluoranthene	20.1%
B55-PDI-SB-17 (9-10) 11172020 RE B55-PDI-SB-19 (11.6-12.6) 11172020 RE B55-PDI-SB-18 (10.7-11.7) 11172020 RE B55-PDI-SB-19 (12.6-13.6) 11172020 RE B55-PDI-SB-18 (9.5-10.5) 11172020 RE B55-PDI-SB-21 (4.5-5.5) 11172020 RE B55-PDI-SB-17 (8-9) 11172020 RE B55-PDI-SB-06 (12-13) 11172020 RE	CCV %D	Triethylamine	-42.4%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
B55-PDI-SB-19 (11.6-12.6) 11172020	2,4-Dinitrophenol	<LL but >10%	AC
	2,4-Dinitrotoluene	<LL but >10%	<LL but >10%
	2,6-Dinitrotoluene	<LL but >10%	<LL but >10%
	2-Nitroaniline	AC	<LL but >10%
	2-Nitrophenol	<LL but >10%	<LL but >10%
	4,6-Dinitro-2-methylphenol	<LL but >10%	<LL but >10%
	Hexachlorocyclopentadiene	0%	0%
	Dibenz(a,h)anthracene	AC	<LL but >10%
	Dimethyl phthalate	AC	<LL but >10%
	Hexachloroethane	AC	<LL but >10%

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than the control limit are presented in the following table.

Sample Locations	Compound
B55-PDI-SB-19 (11.6-12.6) 11172020	2,4-Dinitrotoluene
	2,6-Dinitrotoluene
	4,6-Dinitro-2-methylphenol
	Dimethyl phthalate

Sample Locations	Compound
	Hexachloroethane

The criteria used to evaluate the RPD between the MS/MSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
B55-PDI-SB-21 11172020	Dicyclohexlamine	< 10%	< 10%
	Triethylamine	< 10%	< 10%
B55-PDI-SB-17 (9-10) 11172020 B55-PDI-SB-19 (11.6-12.6) 11172020 B55-PDI-SB-18 (10.7-11.7) 11172020 B55-PDI-SB-19 (12.6-13.6) 11172020 B55-PDI-SB-18 (9.5-10.5) 11172020 B55-PDI-SB-21 (4.5-5.5) 11172020 B55-PDI-SB-17 (8-9) 11172020 B55-PDI-SB-06 (12-13) 11172020	Triethylamine	< 10%	<LL but >10%
B55-PDI-SB-17 (9-10) 11172020 RE B55-PDI-SB-19 (11.6-12.6) 11172020 RE B55-PDI-SB-18 (10.7-11.7) 11172020 RE B55-PDI-SB-19 (12.6-13.6) 11172020 RE B55-PDI-SB-18 (9.5-10.5) 11172020 RE B55-PDI-SB-21 (4.5-5.5) 11172020 RE B55-PDI-SB-17 (8-9) 11172020 RE B55-PDI-SB-06 (12-13) 11172020 RE	Triethylamine	<LL but >10%	<LL but >10%

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with this SDG.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
B55-PDI-SB-21 11172020	Dicyclohexylamine	-	220	220 DJ
B55-PDI-SB-19 (11.6-12.6) 11172020	Dicyclohexylamine	-	9.2	7.5 EJ
B55-PDI-SB-19 (12.6-13.6) 11172020	Dicyclohexylamine	-	12	13 EJ
B55-PDI-SB-18 (9.5-10.5) 11172020	Dicyclohexylamine	-	7.7	13 EJ
B55-PDI-SB-17 (8-9) 11172020	Dicyclohexylamine	-	8.6	15 EJ
B55-PDI-SB-06 (12-13) 11172020	Dicyclohexylamine	-	13	16 EJ

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Please note the samples listed above were re-extracted and re-analyzed due to low recoveries (below 10%) associated with the original LCS/LCSD for Dicylcohexlamine. Therefore, results listed above were reported from the re-extraction/re-analysis and qualified as estimated due to the holding time deviation.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

Tentatively identified compounds (TICs) were identified in all sample locations associated with this SDG. SVOC analysis requires that TICs be qualified as estimated (JN).

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270D and 8270D-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
D. Method blanks		X		X	
E. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X	X		
Field/Lab Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
F. Reconstructed ion chromatograms		X		X	
G. Quantitation Reports		X		X	

SVOCs: SW-846 8270D and 8270D-SIM		Reported		Performance Acceptable		Not Required
		No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)						
H.	RT of sample compounds within the established RT windows		X		X	
I.	Quantitation transcriptions/calculations		X		X	
J.	Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

ALDEHYDES ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8315A	Water	3 days until extraction; 3 days from extraction to analysis	Cool to <6 °C
	Soil	14 days until extraction; 3 days from extraction to analysis	Cool to <6 °C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Holding Time	Criteria
B55-PDI-SB-17 (8-9) 11172020 B55-PDI-SB-06 (12-13) 11172020	Analysis completed in 4 Days	3 Days

Sample results associated with sample locations analyzed by analytical method SW-846 8315A were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% is allowed or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires that the surrogate compound exhibits recovery within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
B55-PDI-SB-17 (9-10) 11172020	Acetaldehyde	>UL	>UL

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
B55-PDI-SB-21 11172020 B55-PDI-SB-17 (9-10) 11172020 B55-PDI-SB-19 (11.6-12.6) 11172020 B55-PDI-SB-18 (10.7-11.7) 11172020 B55-PDI-SB-19 (12.6-13.6) 11172020 B55-PDI-SB-18 (9.5-10.5) 11172020 B55-PDI-SB-17 (8-9) 11172020 B55-PDI-SB-06 (12-13) 11172020	Acetaldehyde	>UL	NA

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R

Control Limit	Sample Result	Qualification
	Detect	J

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with this SDG.

9. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows.

All identified compounds met the specified criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL GC

Aldehyde: SW846 8315A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/FID)					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate(MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

SAMPLE COMPLIANCE REPORT

Sample Delivery Group (SDG)	Sampling Date	Protocol	Sample ID	Matrix	Compliancy[1]					Noncompliance
					VOC	SVOC	ALD	PFAS	MET	
410-21255-1	11/17/2020	SW846	B55-PDI-SB-21 11172020	Water	No	No	Yes	-	-	VOC: MS/MSD %R/RPD SVOC: LCS/LCSD%R, Dilution
	11/17/2020	SW846	B55-PDI-SB-17 (9-10) 11172020	Soil	Yes	No	Yes	-	-	SVOC: HT, CCV %D, LCS/LCSD%R
	11/17/2020	SW846	B55-PDI-SB-19 (11.6-12.6) 11172020	Soil	No	No	Yes	-	-	VOC: MS/MSD %R/RPD SVOC: HT, CCV %D, MS/MSD %R/RPD, LCS/LCSD%R
	11/17/2020	SW846	B55-PDI-SB-18 (10.7-11.7) 11172020	Soil	Yes	No	Yes	-	-	SVOC: HT, CCV %D, LCS/LCSD%R
	11/17/2020	SW846	B55-PDI-SB-19 (12.6-13.6) 11172020	Soil	Yes	No	Yes	-	-	SVOC: HT, CCV %D, LCS/LCSD%R
	11/17/2020	SW846	B55-PDI-SB-18 (9.5-10.5) 11172020	Soil	No	No	Yes	-	-	VOC: CCV %D SVOC: HT, CCV %D, LCS/LCSD%R
	11/17/2020	SW846	B55-PDI-SB-21 (4.5-5.5) 11172020	Soil	No	No	Yes	-	-	VOC: TB SVOC: HT, CCV %D, LCS/LCSD%R
	11/17/2020	SW846	B55-PDI-SB-17 (8-9) 11172020	Soil	No	No	No	-	-	VOC: CCV %D SVOC: HT, CCV %D, LCS/LCSD%R ALD: HT
	11/17/2020	SW846	B55-PDI-SB-06 (12-13) 11172020	Soil	No	Yes	Yes	-	-	SVOC: HT, CCV %D, LCS/LCSD%R ALD: HT
	11/17/2020	SW846	TB20083 11172020	Water	Yes	-	-	-	-	

Note:

1 Samples which are compliant with no added validation qualifiers are listed as "yes". Samples which are non-compliant or which have added qualifiers are listed as "no". A "no" designation does not necessarily indicate that the data have been rejected or are otherwise unusable.

VALIDATION PERFORMED BY: Jeffrey L. Davin

SIGNATURE: 

DATE: January 20, 2021

PEER REVIEW: Dennis K. Capria

DATE: January 25, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Environmental Analysis / Custody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-21255 Chain of Custody

nental use only

COC # 616406

Client Information

Client: ARCADIS	Acct. #:
Project Name/#: Bristol-Myers Squibb	PWSID #:
Project Manager: William McCune	P.O. #:
Sampler: Joshua Miller	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☒

For Lab Use Only
FSC: _____
SCR#: _____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Remarks

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil ☒ Sediment ☐ Tissue ☐	Water ☒ Potable ☐ Ground ☐ NPDES ☐ Surface ☐	Other:	Total # of Containers	Short-List Aldehydes SW846	SVOA 8270 D/E (Microwave)	VOCs Solid by 8260 C/D	Short-List Aldehydes WS846	VOCs Water 8260C	SVOAs 8270D MINI	Preservation and Filtration Codes: H	Remarks
B55-PDI-SB-21	11/17/20	1300	X			X		6				X	X	X		
B55-PDI-SB-17 (9-10)		1310		X				5	X	X	X					
B55-PDI-SB-19 (11.6-12.6)		1330		X				5	X	X	X					
B55-PDI-SB-18 (10.7-11.7)		1345		X				5	X	X	X					
B55-PDI-SB-19 (12.6-13.6)		1400		X				5	X	X	X					
B55-PDI-SB-18 (9.5-10.5)		1405		X				5	X	X	X					
B55-PDI-SB-21 (4.5-5.5)		1415		X				5	X	X	X					
B55-PDI-SB-17 (8-9)		1430		X				5	X	X	X					
B55-PDI-SB-06 (12-13)	↓	1445		X				5	X	X	X					
TB 20083	LAB PROVIDED		X			X		1					X			

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Date Collected is 11/16/20

Date Collected is 11/11/20

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: STANDARD

E-mail address: William.McCune@arcadis.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by		Date 11/17/20	Time 1450	Received by	Date / Time
Relinquished by		Date	Time	Received by	Date / Time
Relinquished by		Date	Time	Received by	11/18/20 Date / Time
Relinquished by		Date	Time	Received by	Date / Time 1146
Relinquished by		Date	Time	Received by	11/18/2020 Date / Time 1146

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.1 °C

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*1	LCS/LCSD RPD exceeds control limits.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
F1	MS and/or MSD recovery exceeds control limits.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"

Client Sample ID: B55-PDI-SB-21
Date Collected: 11/17/20 13:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-1
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND			1.0	0.30	ug/L			11/28/20 14:33	1
1,1,2,2-Tetrachloroethane	ND			1.0	0.20	ug/L			11/28/20 14:33	1
1,1,2-Trichloroethane	ND			1.0	0.20	ug/L			11/28/20 14:33	1
1,1-Dichloroethane	ND			1.0	0.20	ug/L			11/28/20 14:33	1
1,1-Dichloroethene	ND			1.0	0.20	ug/L			11/28/20 14:33	1
1,2,3-Trichlorobenzene	ND			5.0	0.40	ug/L			11/28/20 14:33	1
1,2,4-Trichlorobenzene	ND			5.0	0.30	ug/L			11/28/20 14:33	1
1,2,4-Trimethylbenzene	ND			5.0	1.0	ug/L			11/28/20 14:33	1
1,2-Dibromo-3-Chloropropane	ND			5.0	0.30	ug/L			11/28/20 14:33	1
1,2-Dibromoethane	ND			1.0	0.20	ug/L			11/28/20 14:33	1
1,2-Dichlorobenzene	ND			5.0	0.20	ug/L			11/28/20 14:33	1
1,2-Dichloroethane	ND			1.0	0.30	ug/L			11/28/20 14:33	1
1,2-Dichloropropane	ND			1.0	0.20	ug/L			11/28/20 14:33	1
1,3,5-Trimethylbenzene	ND			5.0	0.30	ug/L			11/28/20 14:33	1
1,3-Dichlorobenzene	ND			5.0	0.20	ug/L			11/28/20 14:33	1
1,4-Dichlorobenzene	ND			5.0	0.20	ug/L			11/28/20 14:33	1
1,4-Dioxane	ND	~~F2~~	J	250	29	ug/L			11/28/20 14:33	1
2-Butanone	ND			10	0.30	ug/L			11/28/20 14:33	1
2-Hexanone	ND			10	0.30	ug/L			11/28/20 14:33	1
2-Nitropropane	ND			10	0.80	ug/L			11/28/20 14:33	1
4-Methyl-2-pentanone	ND			10	0.50	ug/L			11/28/20 14:33	1
Acetone	**1.3**	**J**		20	0.70	ug/L			11/28/20 14:33	1
Acetonitrile	ND			100	16	ug/L			11/28/20 14:33	1
Benzene	ND			1.0	0.20	ug/L			11/28/20 14:33	1
Bromochloromethane	ND			5.0	0.20	ug/L			11/28/20 14:33	1
Bromodichloromethane	ND			1.0	0.20	ug/L			11/28/20 14:33	1
Bromoform	ND			4.0	1.0	ug/L			11/28/20 14:33	1
Bromomethane	ND	~~F1 *~~		1.0	0.30	ug/L			11/28/20 14:33	1
Carbon disulfide	ND			5.0	0.20	ug/L			11/28/20 14:33	1
Carbon tetrachloride	ND			1.0	0.20	ug/L			11/28/20 14:33	1
Chlorobenzene	ND			1.0	0.20	ug/L			11/28/20 14:33	1
Chlorodifluoromethane	ND			5.0	2.0	ug/L			11/28/20 14:33	1
Chloroethane	ND	~~F1 *~~		1.0	0.20	ug/L			11/28/20 14:33	1
Chloroform	ND			1.0	0.20	ug/L			11/28/20 14:33	1
Chloromethane	ND	~~F1 *~~		1.0	0.20	ug/L			11/28/20 14:33	1
cis-1,2-Dichloroethene	ND			1.0	0.20	ug/L			11/28/20 14:33	1
cis-1,3-Dichloropropene	ND			1.0	0.20	ug/L			11/28/20 14:33	1
Cyclohexane	ND	~~F2~~	J	5.0	1.0	ug/L			11/28/20 14:33	1
Cyclohexanone	ND			100	25	ug/L			11/28/20 14:33	1
Dibromochloromethane	ND			1.0	0.20	ug/L			11/28/20 14:33	1
Dichlorodifluoromethane	ND	~~*~~		1.0	0.20	ug/L			11/28/20 14:33	1
Ethyl acetate	ND			5.0	0.70	ug/L			11/28/20 14:33	1
Ethyl ether	ND			5.0	0.20	ug/L			11/28/20 14:33	1
Ethylbenzene	ND			1.0	0.40	ug/L			11/28/20 14:33	1
Freon 113	ND	~~F2~~	J	10	0.20	ug/L			11/28/20 14:33	1
Isobutyl alcohol	ND			250	36	ug/L			11/28/20 14:33	1
Isopropylbenzene	ND			5.0	0.20	ug/L			11/28/20 14:33	1
m&p-Xylene	ND			5.0	1.0	ug/L			11/28/20 14:33	1
Methyl acetate	ND			5.0	0.30	ug/L			11/28/20 14:33	1

Client Sample ID: B55-PDI-SB-21
Date Collected: 11/17/20 13:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-1
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Methylcyclohexane	ND		5.0	0.50	ug/L			11/28/20 14:33	1
Methylene Chloride	ND		1.0	0.30	ug/L			11/28/20 14:33	1
Naphthalene	ND		5.0	1.0	ug/L			11/28/20 14:33	1
n-Butanol	ND		250	61	ug/L			11/28/20 14:33	1
n-Butylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
n-Heptane	ND	~~F2~~ J	5.0	2.0	ug/L			11/28/20 14:33	1
o-Xylene	ND		1.0	0.40	ug/L			11/28/20 14:33	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
Styrene	ND		5.0	0.20	ug/L			11/28/20 14:33	1
t-Butyl alcohol	ND		50	12	ug/L			11/28/20 14:33	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			11/28/20 14:33	1
Tetrachloroethene	ND	~~F1~~ J	1.0	0.20	ug/L			11/28/20 14:33	1
Tetrahydrofuran	ND		10	0.70	ug/L			11/28/20 14:33	1
Toluene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Trichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:33	1
Trichlorofluoromethane	ND	~~F1~~	1.0	0.20	ug/L			11/28/20 14:33	1
Vinyl chloride	ND	~~F1*~~	1.0	0.20	ug/L			11/28/20 14:33	1
Xylenes, Total	ND		6.0	1.4	ug/L			11/28/20 14:33	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*11/28/20 14:33*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*11/28/20 14:33*	*1*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*		*11/28/20 14:33*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*11/28/20 14:33*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*11/28/20 14:33*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
1,2,4,5-Tetrachlorobenzene	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,2'-oxybis[1-chloropropane]	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,3,4,6-Tetrachlorophenol	ND		10	4.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4,5-Trichlorophenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4,6-Trichlorophenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4-Dichlorophenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4-Dimethylphenol	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4-Dinitrophenol	ND		30	14	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,4-Dinitrotoluene	ND		5.1	1.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
2,6-Dinitrotoluene	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2-Chloronaphthalene	ND		1.0	0.40	ug/L		11/23/20 17:15	12/02/20 16:42	1
2-Chlorophenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2-Methylnaphthalene	ND		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
2-Methylphenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
2-Nitroaniline	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1

Client Sample ID: B55-PDI-SB-21
Lab Sample ID: 410-21255-1

Date Collected: 11/17/20 13:00
Matrix: Groundwater

Date Received: 11/18/20 11:46

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
3,3'-Dichlorobenzidine	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
3-Nitroaniline	ND		7.1	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
4,6-Dinitro-2-methylphenol	ND		21	8.1	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Bromophenyl-phenylether	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Chloro-3-methylphenol	ND		3.5	1.6	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Chloroaniline	ND		10	4.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Chlorophenyl-phenyl ether	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Methylphenol, 3 & 4	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Nitroaniline	ND		3.0	0.91	ug/L		11/23/20 17:15	12/02/20 16:42	1
4-Nitrophenol	ND		30	10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Acenaphthene	**0.17**	**J**	0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Acenaphthylene	**0.42**	**J**	0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Acetophenone	ND		10	4.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Aniline	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Anthracene	**0.16**	**J**	0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Atrazine	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzaldehyde	ND		10	3.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzo[a]anthracene	**0.98**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzo[a]pyrene	**1.5**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzo[b]fluoranthene	**1.2**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzo[g,h,i]perylene	**0.91**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzo[k]fluoranthene	**0.53**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Benzyl alcohol	ND		30	10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Butylbenzylphthalate	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Caprolactam	ND		11	5.1	ug/L		11/23/20 17:15	12/02/20 16:42	1
Carbazole	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Chrysene	**1.3**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Di-n-butyl phthalate	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Di-n-octyl phthalate	ND		11	5.1	ug/L		11/23/20 17:15	12/02/20 16:42	1
Dibenz(a,h)anthracene	ND		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Dibenzofuran	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Dicyclohexylamine	**38**	***-**	20	10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Diethyl phthalate	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Dimethyl phthalate	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Fluoranthene	**1.5**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Fluorene	**0.18**	**J**	0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Hexachlorobenzene	ND		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Hexachlorobutadiene	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Hexachlorocyclopentadiene	ND		11	5.1	ug/L		11/23/20 17:15	12/02/20 16:42	1
Hexachloroethane	ND		5.1	1.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Indeno[1,2,3-cd]pyrene	**0.73**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Isophorone	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
n,n'-Dimethylaniline	ND		1.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
N-Nitrosodi-n-propylamine	ND		3.0	0.71	ug/L		11/23/20 17:15	12/02/20 16:42	1
N-Nitrosodiphenylamine	ND		3.0	0.71	ug/L		11/23/20 17:15	12/02/20 16:42	1
Naphthalene	ND		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Nitrobenzene	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Pentachlorophenol	ND		5.1	1.0	ug/L		11/23/20 17:15	12/02/20 16:42	1

Client Sample ID: B55-PDI-SB-21

Date Collected: 11/17/20 13:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-1

Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenanthrene	**0.59**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Phenol	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Pyrene	**2.5**		0.51	0.10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Pyridine	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1
Triethylamine	ND	* R	10	10	ug/L		11/23/20 17:15	12/02/20 16:42	1
Bis(2-chloroethoxy)methane	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Bis(2-chloroethyl)ether	ND		2.0	0.51	ug/L		11/23/20 17:15	12/02/20 16:42	1
Bis(2-ethylhexyl) phthalate	ND		11	5.1	ug/L		11/23/20 17:15	12/02/20 16:42	1
1,4-Dioxane	ND		5.1	2.0	ug/L		11/23/20 17:15	12/02/20 16:42	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*7.6*	*J N*	*ug/L*		*10.90*		*11/23/20 17:15*	*12/02/20 16:42*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*72*		*10 - 150*	*11/23/20 17:15*	*12/02/20 16:42*	*1*
2-Fluorobiphenyl (Surr)	*69*		*44 - 102*	*11/23/20 17:15*	*12/02/20 16:42*	*1*
2-Fluorophenol (Surr)	*33*		*10 - 84*	*11/23/20 17:15*	*12/02/20 16:42*	*1*
Nitrobenzene-d5 (Surr)	*69*		*23 - 128*	*11/23/20 17:15*	*12/02/20 16:42*	*1*
p-Terphenyl-d14 (Surr)	*62*		*31 - 113*	*11/23/20 17:15*	*12/02/20 16:42*	*1*
Phenol-d5 (Surr)	*26*		*10 - 67*	*11/23/20 17:15*	*12/02/20 16:42*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND	H	10	3.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
1,2,4,5-Tetrachlorobenzene	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
2,2'-oxybis[1-chloropropane]	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
2,3,4,6-Tetrachlorophenol	ND	H	10	4.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
2,4,5-Trichlorophenol	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
2,4,6-Trichlorophenol	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
2,4-Dichlorophenol	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
2,4-Dimethylphenol	ND	H	10	3.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
2,4-Dinitrophenol	ND	H	30	14	ug/L		12/03/20 17:00	12/07/20 19:11	1
2,4-Dinitrotoluene	ND	H	5.0	1.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
2,6-Dinitrotoluene	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
2-Chloronaphthalene	ND	H	1.0	0.40	ug/L		12/03/20 17:00	12/07/20 19:11	1
2-Chlorophenol	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
2-Methylnaphthalene	**0.12**	**J H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
2-Methylphenol	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
2-Nitroaniline	ND	H	5.0	2.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
2-Nitrophenol	ND	H	10	3.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
3,3'-Dichlorobenzidine	ND	H	10	3.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
3-Nitroaniline	ND	H	7.0	3.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
4,6-Dinitro-2-methylphenol	ND	H	21	8.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
4-Bromophenyl-phenylether	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
4-Chloro-3-methylphenol	ND	H	3.5	1.6	ug/L		12/03/20 17:00	12/07/20 19:11	1
4-Chloroaniline	ND	H	10	4.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
4-Chlorophenyl-phenyl ether	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
Methylphenol, 3 & 4	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
4-Nitroaniline	ND	H	3.0	0.91	ug/L		12/03/20 17:00	12/07/20 19:11	1
4-Nitrophenol	ND	H	30	10	ug/L		12/03/20 17:00	12/07/20 19:11	1

Client Sample ID: B55-PDI-SB-21
Date Collected: 11/17/20 13:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-1
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**0.20**	**J H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Acenaphthylene	**2.3**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Acetophenone	ND	H	10	4.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Aniline	ND	H	10	3.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Anthracene	**0.58**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Atrazine	ND	H	5.0	2.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Benzaldehyde	ND	H	10	3.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Benzo[a]anthracene	**5.7**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Benzo[a]pyrene	**7.4**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Benzo[b]fluoranthene	**6.1**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Benzo[g,h,i]perylene	**3.1**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Benzo[k]fluoranthene	**2.9**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Benzyl alcohol	ND	H	30	10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Butylbenzylphthalate	ND	H *1	5.0	2.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Caprolactam	ND	H	11	5.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Carbazole	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
Chrysene	**6.9**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Di-n-butyl phthalate	ND	H	5.0	2.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Di-n-octyl phthalate	ND	H	11	5.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Dibenz(a,h)anthracene	**0.87**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Dibenzofuran	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
Diethyl phthalate	ND	H	5.0	2.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Dimethyl phthalate	ND	H *1	5.0	2.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Fluoranthene	**7.0**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Fluorene	**0.35**	**J H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Hexachlorobenzene	ND	H	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Hexachlorobutadiene	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
Hexachlorocyclopentadiene	ND	H	11	5.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Hexachloroethane	ND	H	5.0	1.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Indeno[1,2,3-cd]pyrene	**3.0**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Isophorone	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
n,n'-Dimethylaniline	ND	H	1.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
N-Nitrosodi-n-propylamine	ND	H	3.0	0.70	ug/L		12/03/20 17:00	12/07/20 19:11	1
N-Nitrosodiphenylamine	ND	H	3.0	0.70	ug/L		12/03/20 17:00	12/07/20 19:11	1
Naphthalene	**0.24**	**J H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Nitrobenzene	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
Pentachlorophenol	ND	H	5.0	1.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Phenanthrene	**1.3**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Phenol	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
Pyrene	**12**	**H**	0.50	0.10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Pyridine	ND	H	5.0	2.0	ug/L		12/03/20 17:00	12/07/20 19:11	1
Triethylamine	ND	H	10	10	ug/L		12/03/20 17:00	12/07/20 19:11	1
Bis(2-chloroethoxy)methane	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
Bis(2-chloroethyl)ether	ND	H	2.0	0.50	ug/L		12/03/20 17:00	12/07/20 19:11	1
Bis(2-ethylhexyl) phthalate	ND	H	11	5.0	ug/L		12/03/20 17:00	12/07/20 19:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*64*		*10 - 150*	*12/03/20 17:00*	*12/07/20 19:11*	*1*
2-Fluorobiphenyl (Surr)	*72*		*44 - 102*	*12/03/20 17:00*	*12/07/20 19:11*	*1*
2-Fluorophenol (Surr)	*35*		*10 - 84*	*12/03/20 17:00*	*12/07/20 19:11*	*1*

Client Sample ID: B55-PDI-SB-21
Lab Sample ID: 410-21255-1
Date Collected: 11/17/20 13:00
Matrix: Groundwater
Date Received: 11/18/20 11:46

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*72*		*23 - 128*	*12/03/20 17:00*	*12/07/20 19:11*	*1*
p-Terphenyl-d14 (Surr)	*49*		*31 - 113*	*12/03/20 17:00*	*12/07/20 19:11*	*1*
Phenol-d5 (Surr)	*29*		*10 - 67*	*12/03/20 17:00*	*12/07/20 19:11*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**220**	H DJ	100	50	ug/L		12/03/20 17:00	12/07/20 19:39	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*57*		*10 - 150*	*12/03/20 17:00*	*12/07/20 19:39*	*5*
2-Fluorobiphenyl (Surr)	*76*		*44 - 102*	*12/03/20 17:00*	*12/07/20 19:39*	*5*
2-Fluorophenol (Surr)	*36*		*10 - 84*	*12/03/20 17:00*	*12/07/20 19:39*	*5*
Nitrobenzene-d5 (Surr)	*74*		*23 - 128*	*12/03/20 17:00*	*12/07/20 19:39*	*5*
p-Terphenyl-d14 (Surr)	*54*		*31 - 113*	*12/03/20 17:00*	*12/07/20 19:39*	*5*
Phenol-d5 (Surr)	*30*		*10 - 67*	*12/03/20 17:00*	*12/07/20 19:39*	*5*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 19:30	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 19:30	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 19:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*106*		*39 - 153*	*11/20/20 16:15*	*11/23/20 19:30*	*1*

Client Sample ID: B55-PDI-SB-17 (9-10)
Lab Sample ID: 410-21255-2
Date Collected: 11/17/20 13:10
Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment
Matrix: Soil
Date Received: 11/18/20 11:46

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**15.2**		1.0	1.0	%			11/18/20 22:01	1

Client Sample ID: B55-PDI-SB-17 (9-10)
Lab Sample ID: 410-21255-2
Date Collected: 11/17/20 13:10
Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Date Received: 11/18/20 11:46
Percent Solids: 84.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,1,2,2-Tetrachloroethane	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,1,2-Trichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,1-Dichloroethane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,1-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2,3-Trichlorobenzene	ND		0.0080	0.0040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2,4-Trichlorobenzene	ND		0.0080	0.0040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2,4-Trimethylbenzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2-Dibromo-3-Chloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2-Dibromoethane	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,2-Dichloroethane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1

Client Sample ID: B55-PDI-SB-17 (9-10)
Lab Sample ID: 410-21255-2

Date Collected: 11/17/20 13:10 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,3,5-Trimethylbenzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,3-Dichlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,4-Dichlorobenzene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
1,4-Dioxane	ND		0.20	0.030	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
2-Butanone	**0.0025**	**J**	0.0080	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
2-Hexanone	ND		0.0080	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
2-Nitropropane	ND		0.0080	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
4-Methyl-2-pentanone	ND		0.0080	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Acetone	**0.039**		0.016	0.0048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Acetonitrile	ND		0.080	0.020	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Benzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Bromochloromethane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Bromodichloromethane	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Bromoform	ND		0.0080	0.0040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Bromomethane	ND		0.0040	0.00056	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Carbon disulfide	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Carbon tetrachloride	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Chlorobenzene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Chlorodifluoromethane	ND		0.0080	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Chloroethane	ND		0.0040	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Chloroform	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Chloromethane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
cis-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
cis-1,3-Dichloropropene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Cyclohexane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Cyclohexanone	**0.10**	**J**	0.20	0.020	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Dibromochloromethane	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Dichlorodifluoromethane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Ethyl acetate	ND		0.0040	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Ethyl ether	ND		0.0040	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Ethylbenzene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Freon 113	ND		0.0080	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Isobutyl alcohol	ND		0.20	0.030	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Isopropylbenzene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
m&p-Xylene	ND		0.0040	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Methyl acetate	ND		0.0040	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Methyl tertiary butyl ether	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Methylcyclohexane	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Methylene Chloride	ND		0.0040	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Naphthalene	ND		0.0040	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
n-Butanol	ND		0.20	0.045	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
n-Butylbenzene	ND		0.0064	0.0024	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
n-Heptane	ND		0.0064	0.0024	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
o-Xylene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
p-Isopropyltoluene	ND		0.0040	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
sec-Butylbenzene	ND		0.0040	0.0016	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Styrene	ND		0.0040	0.00032	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
t-Butyl alcohol	**0.033**	**J**	0.080	0.012	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1

Client Sample ID: B55-PDI-SB-17 (9-10)
Lab Sample ID: 410-21255-2

Date Collected: 11/17/20 13:10 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	ND		0.0040	0.00064	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Tetrachloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Tetrahydrofuran	ND		0.0064	0.00080	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Toluene	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
trans-1,2-Dichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
trans-1,3-Dichloropropene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Trichloroethene	ND		0.0040	0.00040	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Trichlorofluoromethane	ND		0.0040	0.00056	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Vinyl chloride	ND		0.0040	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1
Xylenes, Total	ND		0.0080	0.0011	mg/Kg	☼	11/18/20 22:22	11/24/20 15:56	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.013*	*T J N*	*mg/Kg*	☼	*5.21*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Cyclopentane, 1,2,4-trimethyl-	*0.013*	*T J N*	*mg/Kg*	☼	*6.26*	*2815-58-9*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
Unknown	*0.013*	*T J N*	*mg/Kg*	☼	*7.86*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Cyclohexane, 1,2,4-trimethyl-	*0.012*	*T J N*	*mg/Kg*	☼	*8.24*	*2234-75-5*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
Unknown	*0.014*	*T J N*	*mg/Kg*	☼	*8.95*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Nonane, 3-methyl-	*0.014*	*T J N*	*mg/Kg*	☼	*9.11*	*5911-04-6*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
Unknown	*0.016*	*T J N*	*mg/Kg*	☼	*9.17*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Unknown	*0.012*	*T J N*	*mg/Kg*	☼	*9.23*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Unknown	*0.012*	*T J N*	*mg/Kg*	☼	*9.92*		*11/18/20 22:22*	*11/24/20 15:56*	*1*
Benzene, 2,4-diethyl-1-methyl-	*0.014*	*T J N*	*mg/Kg*	☼	*11.62*	*1758-85-6*	*11/18/20 22:22*	*11/24/20 15:56*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*54 - 135*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
4-Bromofluorobenzene (Surr)	*100*		*50 - 131*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/18/20 22:22*	*11/24/20 15:56*	*1*
Toluene-d8 (Surr)	*102*		*52 - 141*	*11/18/20 22:22*	*11/24/20 15:56*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
1,2,4,5-Tetrachlorobenzene	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,2'-oxybis[1-chloropropane]	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4,5-Trichlorophenol	ND		0.078	0.035	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4,6-Trichlorophenol	ND		0.067	0.031	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4-Dichlorophenol	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4-Dimethylphenol	ND		0.078	0.035	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4-Dinitrophenol	ND		1.2	0.39	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,4-Dinitrotoluene	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2,6-Dinitrotoluene	ND		0.059	0.027	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Chloronaphthalene	ND		0.039	0.0078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Chlorophenol	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Methylnaphthalene	ND		0.039	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Methylphenol	ND		0.078	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Nitroaniline	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
2-Nitrophenol	ND		0.067	0.031	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
3,3'-Dichlorobenzidine	ND		0.39	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
3-Nitroaniline	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1

Client Sample ID: B55-PDI-SB-17 (9-10)
Lab Sample ID: 410-21255-2

Date Collected: 11/17/20 13:10 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,6-Dinitro-2-methylphenol	ND		0.59	0.27	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Bromophenyl-phenylether	ND		0.059	0.027	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Chloro-3-methylphenol	ND		0.059	0.027	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Methylphenol, 3 & 4	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Nitroaniline	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Nitrophenol	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Acenaphthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Acenaphthylene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Acetophenone	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Anthracene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Atrazine	ND		0.51	0.24	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzaldehyde	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzo[a]anthracene	ND		0.020	0.0078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzo[a]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzo[b]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzo[g,h,i]perylene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Benzo[k]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Bis(2-chloroethoxy)methane	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Bis(2-chloroethyl)ether	ND		0.059	0.027	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Butylbenzylphthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Caprolactam	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Carbazole	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Chrysene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Di-n-butyl phthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Di-n-octyl phthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Dibenz(a,h)anthracene	ND		0.020	0.0078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Dibenzofuran	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Diethyl phthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Dimethyl phthalate	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Chloroaniline	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Fluorene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
4-Chlorophenyl-phenyl ether	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Hexachlorobenzene	ND		0.020	0.0078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Hexachlorobutadiene	ND		0.090	0.043	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Hexachlorocyclopentadiene	ND		0.59	0.24	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Hexachloroethane	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Isophorone	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
N-Nitrosodi-n-propylamine	ND		0.059	0.027	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
N-Nitrosodiphenylamine	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Naphthalene	ND		0.020	0.0078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Nitrobenzene	ND		0.078	0.031	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Phenanthrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Aniline	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Phenol	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Pentachlorophenol	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1

Client Sample ID: B55-PDI-SB-17 (9-10)
Lab Sample ID: 410-21255-2

Date Collected: 11/17/20 13:10 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzyl alcohol	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Dicyclohexylamine	**4.1**		2.4	0.78	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
n,n'-Dimethylaniline	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Pyridine	ND		0.20	0.078	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
Triethylamine	ND	*- *1	5.9	2.0	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1
1,4-Dioxane	ND		0.39	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 22:01	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.24*	*T J N*	*mg/Kg*	☼	*1.76*		*11/24/20 16:27*	*11/25/20 22:01*	*1*
Unknown	*0.98*	*T J N*	*mg/Kg*	☼	*3.24*		*11/24/20 16:27*	*11/25/20 22:01*	*1*
Unknown	*12*	*T J B N*	*mg/Kg*	☼	*3.90*		*11/24/20 16:27*	*11/25/20 22:01*	*1*
1,2,4-Trithiolane	*0.21*	*T J N*	*mg/Kg*	☼	*6.19*	*289-16-7*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
1,2,4,5-Tetrathiane	*0.21*	*T J N*	*mg/Kg*	☼	*7.85*	*291-22-5*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
Unknown	*0.18*	*T J N*	*mg/Kg*	☼	*7.99*		*11/24/20 16:27*	*11/25/20 22:01*	*1*
Unknown	*0.54*	*T J N*	*mg/Kg*	☼	*8.40*		*11/24/20 16:27*	*11/25/20 22:01*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.28*	*T J N*	*mg/Kg*	☼	*8.60*	*7560-83-0*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
Lenthionine	*0.41*	*T J N*	*mg/Kg*	☼	*9.33*	*292-46-6*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
Unknown	*0.46*	*T J N*	*mg/Kg*	☼	*9.75*		*11/24/20 16:27*	*11/25/20 22:01*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*100*		*45 - 108*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
Nitrobenzene-d5 (Surr)	*68*		*32 - 97*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
2-Fluorophenol (Surr)	*83*		*26 - 96*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
2-Fluorobiphenyl (Surr)	*84*		*39 - 100*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
2,4,6-Tribromophenol (Surr)	*88*		*13 - 121*	*11/24/20 16:27*	*11/25/20 22:01*	*1*
Phenol-d5 (Surr)	*88*		*27 - 104*	*11/24/20 16:27*	*11/25/20 22:01*	*1*

Compounds Dicyclohexylamine, n,n'-Dimethylamine and Triethylamine are reported from the "RE" analysis.

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND	H	0.043	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
1,2,4,5-Tetrachlorobenzene	ND	H	0.043	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2,2'-oxybis[1-chloropropane]	ND	H	0.051	0.023	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2,3,4,6-Tetrachlorophenol	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2,4,5-Trichlorophenol	ND	H	0.078	0.035	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2,4,6-Trichlorophenol	ND	H	0.066	0.031	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2,4-Dichlorophenol	ND	H	0.051	0.023	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2,4-Dimethylphenol	ND	H	0.078	0.035	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2,4-Dinitrophenol	ND	H	1.2	0.39	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2,4-Dinitrotoluene	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2,6-Dinitrotoluene	ND	H	0.058	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2-Chloronaphthalene	ND	H	0.039	0.0078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2-Chlorophenol	ND	H	0.043	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2-Methylnaphthalene	ND	H	0.039	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2-Methylphenol	ND	H	0.078	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2-Nitroaniline	ND	H	0.058	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
2-Nitrophenol	ND	H	0.066	0.031	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
3,3'-Dichlorobenzidine	ND	H	0.39	0.12	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
3-Nitroaniline	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
4,6-Dinitro-2-methylphenol	ND	H	0.58	0.27	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1

Client Sample ID: B55-PDI-SB-17 (9-10)
Lab Sample ID: 410-21255-2

Date Collected: 11/17/20 13:10 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 84.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Bromophenyl-phenylether	ND	H	0.058	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
4-Chloro-3-methylphenol	ND	H	0.058	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Methylphenol, 3 & 4	ND	H	0.058	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
4-Nitroaniline	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
4-Nitrophenol	ND	H	0.58	0.19	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Acenaphthene	ND	H	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Acenaphthylene	ND	H	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Acetophenone	ND	H	0.058	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Anthracene	**0.0055**	**J H**	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Atrazine	ND	H	0.51	0.23	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Benzaldehyde	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Benzo[a]anthracene	ND	H	0.019	0.0078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Benzo[a]pyrene	ND	H	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Benzo[b]fluoranthene	ND	H	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Benzo[g,h,i]perylene	ND	H	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Benzo[k]fluoranthene	ND	H	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Bis(2-chloroethoxy)methane	ND	H	0.043	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Bis(2-chloroethyl)ether	ND	H	0.058	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Bis(2-ethylhexyl) phthalate	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Butylbenzylphthalate	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Caprolactam	ND	H	0.19	0.039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Carbazole	ND	H	0.043	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Chrysene	**0.0053**	**J H**	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Di-n-butyl phthalate	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Di-n-octyl phthalate	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Dibenz(a,h)anthracene	ND	H	0.019	0.0078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Dibenzofuran	ND	H	0.043	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Diethyl phthalate	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Dimethyl phthalate	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Fluoranthene	**0.0070**	**J H**	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
4-Chloroaniline	ND	H	0.19	0.039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Fluorene	ND	H	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
4-Chlorophenyl-phenyl ether	ND	H	0.051	0.023	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Hexachlorobenzene	ND	H	0.019	0.0078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Hexachlorobutadiene	ND	H	0.090	0.043	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Hexachlorocyclopentadiene	ND	H	0.58	0.23	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Hexachloroethane	ND	H	0.19	0.039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Indeno[1,2,3-cd]pyrene	ND	H	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Isophorone	ND	H	0.043	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
N-Nitrosodi-n-propylamine	ND	H	0.058	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
N-Nitrosodiphenylamine	ND	H	0.043	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Naphthalene	ND	H	0.019	0.0078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Nitrobenzene	ND	H	0.078	0.031	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Phenanthrene	**0.0079**	**J H**	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Aniline	ND	H	0.58	0.19	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Phenol	ND	H	0.043	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Pyrene	**0.0093**	**J H**	0.019	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Pentachlorophenol	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Benzyl alcohol	ND	H	0.58	0.19	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1

Client Sample ID: B55-PDI-SB-17 (9-10)
Lab Sample ID: 410-21255-2

Date Collected: 11/17/20 13:10 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Percent Solids: 84.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**4.7**	~~H~~ J	2.3	0.78	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
n,n'-Dimethylaniline	ND	~~H~~ J	0.19	0.039	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Pyridine	ND	H	0.19	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1
Triethylamine	ND	~~H * *1~~ J	5.8	1.9	mg/Kg	☼	12/03/20 16:08	12/04/20 14:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*96*		*45 - 108*	*12/03/20 16:08*	*12/04/20 14:27*	*1*
Nitrobenzene-d5 (Surr)	*60*		*32 - 97*	*12/03/20 16:08*	*12/04/20 14:27*	*1*
2-Fluorophenol (Surr)	*77*		*26 - 96*	*12/03/20 16:08*	*12/04/20 14:27*	*1*
2-Fluorobiphenyl (Surr)	*79*		*39 - 100*	*12/03/20 16:08*	*12/04/20 14:27*	*1*
2,4,6-Tribromophenol (Surr)	*54*		*13 - 121*	*12/03/20 16:08*	*12/04/20 14:27*	*1*
Phenol-d5 (Surr)	*81*		*27 - 104*	*12/03/20 16:08*	*12/04/20 14:27*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	~~* F1~~	0.059	0.029	mg/Kg	☼	11/20/20 13:08	11/23/20 22:56	1
Formaldehyde	**0.12**		0.088	0.029	mg/Kg	☼	11/20/20 13:08	11/23/20 22:56	1
Glutaraldehyde	ND		0.059	0.029	mg/Kg	☼	11/20/20 13:08	11/23/20 22:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*108*		*77 - 133*	*11/20/20 13:08*	*11/23/20 22:56*	*1*

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Lab Sample ID: 410-21255-3

Date Collected: 11/17/20 13:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment
Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**19.0**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Lab Sample ID: 410-21255-3

Date Collected: 11/17/20 13:30
Date Received: 11/18/20 11:46
Matrix: Soil
Percent Solids: 81.0

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,1,2,2-Tetrachloroethane	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,1,2-Trichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,1-Dichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,1-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2,3-Trichlorobenzene	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2,4-Trichlorobenzene	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2,4-Trimethylbenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2-Dibromo-3-Chloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2-Dibromoethane	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2-Dichlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2-Dichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,2-Dichloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,3,5-Trimethylbenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,3-Dichlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Lab Sample ID: 410-21255-3

Date Collected: 11/17/20 13:30
Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date
Matrix: Soil

Date Received: 11/18/20 11:46
Percent Solids: 81.0

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
1,4-Dioxane	ND		0.23	0.034	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
2-Butanone	**0.0023**	**J**	0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
2-Hexanone	ND		0.0091	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
2-Nitropropane	ND		0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
4-Methyl-2-pentanone	ND		0.0091	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Acetone	**0.035**		0.018	0.0055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Acetonitrile	ND		0.091	0.023	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Benzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Bromochloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Bromodichloromethane	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Bromoform	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Bromomethane	ND		0.0046	0.00064	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Carbon disulfide	**0.0017**	**J**	0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Carbon tetrachloride	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Chlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Chlorodifluoromethane	ND		0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Chloroethane	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Chloroform	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Chloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
cis-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
cis-1,3-Dichloropropene	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Cyclohexane	**0.0067**		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Cyclohexanone	ND		0.23	0.023	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Dibromochloromethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Dichlorodifluoromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Ethyl acetate	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Ethyl ether	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Ethylbenzene	**0.00079**	**J**	0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Freon 113	ND		0.0091	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Isobutyl alcohol	ND		0.23	0.035	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Isopropylbenzene	**0.00066**	**J**	0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
m&p-Xylene	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Methyl acetate	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Methyl tertiary butyl ether	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Methylcyclohexane	**0.0021**	**J**	0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Methylene Chloride	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Naphthalene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
n-Butanol	ND		0.23	0.051	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
n-Butylbenzene	ND		0.0073	0.0027	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
n-Heptane	ND		0.0073	0.0027	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
o-Xylene	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
p-Isopropyltoluene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
sec-Butylbenzene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Styrene	ND		0.0046	0.00037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
t-Butyl alcohol	**0.015**	**J**	0.091	0.014	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
tert-Butylbenzene	ND		0.0046	0.00073	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Tetrachloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Tetrahydrofuran	ND		0.0073	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)

Date Collected: 11/17/20 13:30
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-3

Matrix: Soil
Percent Solids: 81.0

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
trans-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
trans-1,3-Dichloropropene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Trichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Trichlorofluoromethane	ND		0.0046	0.00064	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Vinyl chloride	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1
Xylenes, Total	ND		0.0091	0.0013	mg/Kg	☼	11/18/20 22:22	11/24/20 16:19	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.0063*	*T J N*	*mg/Kg*	☼	*10.47*		*11/18/20 22:22*	*11/24/20 16:19*	*1*
Benzene, 1,2,4,5-tetramethyl-	*0.0062*	*T J N*	*mg/Kg*	☼	*11.06*	*95-93-2*	*11/18/20 22:22*	*11/24/20 16:19*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*54 - 135*	*11/18/20 22:22*	*11/24/20 16:19*	*1*
4-Bromofluorobenzene (Surr)	*98*		*50 - 131*	*11/18/20 22:22*	*11/24/20 16:19*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/18/20 22:22*	*11/24/20 16:19*	*1*
Toluene-d8 (Surr)	*103*		*52 - 141*	*11/18/20 22:22*	*11/24/20 16:19*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
1,2,4,5-Tetrachlorobenzene	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,2'-oxybis[1-chloropropane]	ND		0.053	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4,5-Trichlorophenol	ND		0.081	0.037	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4,6-Trichlorophenol	ND		0.069	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4-Dichlorophenol	ND		0.053	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4-Dimethylphenol	ND		0.081	0.037	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4-Dinitrophenol	ND	F1 J	1.2	0.41	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,4-Dinitrotoluene	ND	F2 F1 J	0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2,6-Dinitrotoluene	ND	F2 F1 J	0.061	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Chloronaphthalene	ND		0.041	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Chlorophenol	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Methylnaphthalene	ND		0.041	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Methylphenol	ND		0.081	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Nitroaniline	ND	F1 J	0.061	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
2-Nitrophenol	ND	F1 J	0.069	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
3,3'-Dichlorobenzidine	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
3-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4,6-Dinitro-2-methylphenol	ND	F2 F1 J	0.61	0.28	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Bromophenyl-phenylether	ND		0.061	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Chloro-3-methylphenol	ND		0.061	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Methylphenol, 3 & 4	ND		0.061	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Nitrophenol	ND		0.61	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Acenaphthene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Acenaphthylene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Acetophenone	ND		0.061	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Anthracene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Atrazine	ND		0.53	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)

Date Collected: 11/17/20 13:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-3

Matrix: Soil
Percent Solids: 81.0

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzaldehyde	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzo[a]anthracene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzo[a]pyrene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzo[b]fluoranthene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzo[g,h,i]perylene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzo[k]fluoranthene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Bis(2-chloroethoxy)methane	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Bis(2-chloroethyl)ether	ND		0.061	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Butylbenzylphthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Caprolactam	ND		0.20	0.041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Carbazole	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Chrysene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Di-n-butyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Di-n-octyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Dibenz(a,h)anthracene	ND	F1 J	0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Dibenzofuran	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Diethyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Dimethyl phthalate	ND	F2 F1 J	0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Fluoranthene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Chloroaniline	ND		0.20	0.041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Fluorene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
4-Chlorophenyl-phenyl ether	ND		0.053	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Hexachlorobenzene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Hexachlorobutadiene	ND		0.093	0.045	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Hexachlorocyclopentadiene	ND	F1 R	0.61	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Hexachloroethane	ND	F2 F1 J	0.20	0.041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Isophorone	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
N-Nitrosodi-n-propylamine	ND		0.061	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
N-Nitrosodiphenylamine	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Naphthalene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Nitrobenzene	ND		0.081	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Phenanthrene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Aniline	ND		0.61	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Phenol	ND		0.045	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Pyrene	ND		0.020	0.0041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Pentachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Benzyl alcohol	ND		0.61	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
n,n'-Dimethylaniline	ND		0.20	0.041	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Pyridine	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
Triethylamine	ND	*- *1	6.1	2.0	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1
1,4-Dioxane	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 13:42	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*5.8*	*T J N*	*mg/Kg*	☼	*3.23*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*10*	*T J B N*	*mg/Kg*	☼	*3.87*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*0.21*	*T J N*	*mg/Kg*	☼	*5.43*		*11/24/20 16:27*	*11/26/20 13:42*	*1*
1,2,4-Trithiolane	*1.2*	*T J N*	*mg/Kg*	☼	*6.17*	*289-16-7*	*11/24/20 16:27*	*11/26/20 13:42*	*1*
Unknown	*0.26*	*T J N*	*mg/Kg*	☼	*6.28*		*11/24/20 16:27*	*11/26/20 13:42*	*1*

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Lab Sample ID: 410-21255-3

Date Collected: 11/17/20 13:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 81.0

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	0.19	T J N	mg/Kg	☼	7.07		11/24/20 16:27	11/26/20 13:42	1
Unknown	0.17	T J N	mg/Kg	☼	7.83		11/24/20 16:27	11/26/20 13:42	1
Unknown	1.1	T J N	mg/Kg	☼	8.24		11/24/20 16:27	11/26/20 13:42	1
Unknown	0.75	T J N	mg/Kg	☼	8.27		11/24/20 16:27	11/26/20 13:42	1
Unknown	2.2	T J N	mg/Kg	☼	8.28		11/24/20 16:27	11/26/20 13:42	1
Unknown	1.4	T J N	mg/Kg	☼	8.37		11/24/20 16:27	11/26/20 13:42	1
Cyclohexanamine, N-cyclohexyl-N-methyl-	0.47	T J N	mg/Kg	☼	8.58	7560-83-0	11/24/20 16:27	11/26/20 13:42	1
Lenthionine	0.71	T J N	mg/Kg	☼	9.31	292-46-6	11/24/20 16:27	11/26/20 13:42	1
Unknown	0.44	T J N	mg/Kg	☼	9.73		11/24/20 16:27	11/26/20 13:42	1
Unknown	0.44	T J N	mg/Kg	☼	10.05		11/24/20 16:27	11/26/20 13:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	101		45 - 108	11/24/20 16:27	11/26/20 13:42	1
Nitrobenzene-d5 (Surr)	62		32 - 97	11/24/20 16:27	11/26/20 13:42	1
2-Fluorophenol (Surr)	82		26 - 96	11/24/20 16:27	11/26/20 13:42	1
2-Fluorobiphenyl (Surr)	82		39 - 100	11/24/20 16:27	11/26/20 13:42	1
2,4,6-Tribromophenol (Surr)	72		13 - 121	11/24/20 16:27	11/26/20 13:42	1
Phenol-d5 (Surr)	87		27 - 104	11/24/20 16:27	11/26/20 13:42	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**9.2**		4.9	1.6	mg/Kg	☼	11/24/20 16:27	12/03/20 11:21	2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	93		45 - 108	11/24/20 16:27	12/03/20 11:21	2
Nitrobenzene-d5 (Surr)	60		32 - 97	11/24/20 16:27	12/03/20 11:21	2
2-Fluorophenol (Surr)	75		26 - 96	11/24/20 16:27	12/03/20 11:21	2
2-Fluorobiphenyl (Surr)	76		39 - 100	11/24/20 16:27	12/03/20 11:21	2
2,4,6-Tribromophenol (Surr)	67		13 - 121	11/24/20 16:27	12/03/20 11:21	2
Phenol-d5 (Surr)	78		27 - 104	11/24/20 16:27	12/03/20 11:21	2

Compounds Dicyclohexylamine, n,n'-Dimethylamine and Triethylamine are reported from the "RE" analysis.

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND	H	0.045	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
1,2,4,5-Tetrachlorobenzene	ND	H	0.045	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2,2'-oxybis[1-chloropropane]	ND	H	0.054	0.025	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2,3,4,6-Tetrachlorophenol	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2,4,5-Trichlorophenol	ND	H	0.082	0.037	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2,4,6-Trichlorophenol	ND	H	0.070	0.033	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2,4-Dichlorophenol	ND	H	0.054	0.025	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2,4-Dimethylphenol	ND	H	0.082	0.037	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2,4-Dinitrophenol	ND	H	1.2	0.41	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2,4-Dinitrotoluene	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2,6-Dinitrotoluene	ND	H	0.062	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2-Chloronaphthalene	ND	H	0.041	0.0082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2-Chlorophenol	ND	H	0.045	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2-Methylnaphthalene	**0.0044**	**J H**	0.041	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2-Methylphenol	ND	H	0.082	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
2-Nitroaniline	ND	H	0.062	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Lab Sample ID: 410-21255-3

Date Collected: 11/17/20 13:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 81.0

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	ND	H	0.070	0.033	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
3,3'-Dichlorobenzidine	ND	H	0.41	0.12	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
3-Nitroaniline	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
4,6-Dinitro-2-methylphenol	ND	H	0.62	0.29	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
4-Bromophenyl-phenylether	ND	H	0.062	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
4-Chloro-3-methylphenol	ND	H	0.062	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Methylphenol, 3 & 4	ND	H	0.062	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
4-Nitroaniline	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
4-Nitrophenol	ND	H	0.62	0.21	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Acenaphthene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Acenaphthylene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Acetophenone	ND	H	0.062	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Anthracene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Atrazine	ND	H	0.54	0.25	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Benzaldehyde	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Benzo[a]anthracene	ND	H	0.021	0.0082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Benzo[a]pyrene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Benzo[b]fluoranthene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Benzo[g,h,i]perylene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Benzo[k]fluoranthene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Bis(2-chloroethoxy)methane	ND	H	0.045	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Bis(2-chloroethyl)ether	ND	H	0.062	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Bis(2-ethylhexyl) phthalate	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Butylbenzylphthalate	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Caprolactam	ND	H	0.21	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Carbazole	ND	H	0.045	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Chrysene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Di-n-butyl phthalate	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Di-n-octyl phthalate	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Dibenz(a,h)anthracene	ND	H	0.021	0.0082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Dibenzofuran	ND	H	0.045	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Diethyl phthalate	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Dimethyl phthalate	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Fluoranthene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
4-Chloroaniline	ND	H	0.21	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Fluorene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
4-Chlorophenyl-phenyl ether	ND	H	0.054	0.025	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Hexachlorobenzene	ND	H	0.021	0.0082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Hexachlorobutadiene	ND	H	0.095	0.045	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Hexachlorocyclopentadiene	ND	H	0.62	0.25	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Hexachloroethane	ND	H	0.21	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Indeno[1,2,3-cd]pyrene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Isophorone	ND	H	0.045	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
N-Nitrosodi-n-propylamine	ND	H	0.062	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
N-Nitrosodiphenylamine	ND	H	0.045	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Naphthalene	ND	H	0.021	0.0082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Nitrobenzene	ND	H	0.082	0.033	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Phenanthrene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Aniline	ND	H	0.62	0.21	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1

Client Sample ID: B55-PDI-SB-19 (11.6-12.6)
Lab Sample ID: 410-21255-3

Date Collected: 11/17/20 13:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 81.0

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenol	ND	H	0.045	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Pyrene	ND	H	0.021	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Pentachlorophenol	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Benzyl alcohol	ND	H	0.62	0.21	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Dicyclohexylamine	**7.5**	~~H~~ E	2.5	0.82	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
n,n'-Dimethylaniline	ND	~~H~~	0.21	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Pyridine	ND	H	0.21	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1
Triethylamine	ND	~~H * *1~~	6.2	2.1	mg/Kg	☼	12/03/20 16:08	12/04/20 14:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*97*		*45 - 108*	*12/03/20 16:08*	*12/04/20 14:50*	*1*
Nitrobenzene-d5 (Surr)	*61*		*32 - 97*	*12/03/20 16:08*	*12/04/20 14:50*	*1*
2-Fluorophenol (Surr)	*77*		*26 - 96*	*12/03/20 16:08*	*12/04/20 14:50*	*1*
2-Fluorobiphenyl (Surr)	*77*		*39 - 100*	*12/03/20 16:08*	*12/04/20 14:50*	*1*
2,4,6-Tribromophenol (Surr)	*52*		*13 - 121*	*12/03/20 16:08*	*12/04/20 14:50*	*1*
Phenol-d5 (Surr)	*79*		*27 - 104*	*12/03/20 16:08*	*12/04/20 14:50*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	~~*~~	0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:07	1
Formaldehyde	**0.092**	J	0.093	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:07	1
Glutaraldehyde	ND		0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*108*		*77 - 133*	*11/20/20 13:08*	*11/23/20 23:07*	*1*

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)
Lab Sample ID: 410-21255-4

Date Collected: 11/17/20 13:45 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**19.3**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)
Lab Sample ID: 410-21255-4

Date Collected: 11/17/20 13:45 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 80.7

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,1,2,2-Tetrachloroethane	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,1,2-Trichloroethane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,1-Dichloroethane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,1-Dichloroethene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2,3-Trichlorobenzene	ND		0.0097	0.0048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2,4-Trichlorobenzene	ND		0.0097	0.0048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2,4-Trimethylbenzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2-Dibromo-3-Chloropropane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2-Dibromoethane	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2-Dichlorobenzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)
Lab Sample ID: 410-21255-4

Date Collected: 11/17/20 13:45 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 80.7

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,2-Dichloropropane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,3,5-Trimethylbenzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,3-Dichlorobenzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,4-Dichlorobenzene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
1,4-Dioxane	ND		0.24	0.036	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
2-Butanone	ND		0.0097	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
2-Hexanone	ND		0.0097	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
2-Nitropropane	ND		0.0097	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
4-Methyl-2-pentanone	ND		0.0097	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Acetone	**0.023**		0.019	0.0058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Acetonitrile	ND		0.097	0.024	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Benzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Bromochloromethane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Bromodichloromethane	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Bromoform	ND		0.0097	0.0048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Bromomethane	ND		0.0048	0.00068	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Carbon disulfide	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Carbon tetrachloride	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Chlorobenzene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Chlorodifluoromethane	ND		0.0097	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Chloroethane	ND		0.0048	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Chloroform	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Chloromethane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
cis-1,2-Dichloroethene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
cis-1,3-Dichloropropene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Cyclohexane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Cyclohexanone	ND		0.24	0.024	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Dibromochloromethane	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Dichlorodifluoromethane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Ethyl acetate	ND		0.0048	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Ethyl ether	ND		0.0048	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Ethylbenzene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Freon 113	ND		0.0097	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Isobutyl alcohol	ND		0.24	0.037	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Isopropylbenzene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
m&p-Xylene	ND		0.0048	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Methyl acetate	ND		0.0048	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Methyl tertiary butyl ether	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Methylcyclohexane	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Methylene Chloride	ND		0.0048	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Naphthalene	ND		0.0048	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
n-Butanol	ND		0.24	0.054	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
n-Butylbenzene	ND		0.0077	0.0029	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
n-Heptane	ND		0.0077	0.0029	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
o-Xylene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
p-Isopropyltoluene	ND		0.0048	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
sec-Butylbenzene	ND		0.0048	0.0019	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Styrene	ND		0.0048	0.00039	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)
Lab Sample ID: 410-21255-4
Date Collected: 11/17/20 13:45 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment
Matrix: Soil
Percent Solids: 80.7

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
t-Butyl alcohol	ND		0.097	0.015	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
tert-Butylbenzene	ND		0.0048	0.00077	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Tetrachloroethene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Tetrahydrofuran	ND		0.0077	0.00097	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Toluene	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
trans-1,2-Dichloroethene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
trans-1,3-Dichloropropene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Trichloroethene	ND		0.0048	0.00048	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Trichlorofluoromethane	ND		0.0048	0.00068	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Vinyl chloride	ND		0.0048	0.00058	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1
Xylenes, Total	ND		0.0097	0.0014	mg/Kg	☼	11/18/20 22:22	11/24/20 16:41	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*	☼			*11/18/20 22:22*	*11/24/20 16:41*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*54 - 135*	*11/18/20 22:22*	*11/24/20 16:41*	*1*
4-Bromofluorobenzene (Surr)	*96*		*50 - 131*	*11/18/20 22:22*	*11/24/20 16:41*	*1*
Dibromofluoromethane (Surr)	*97*		*50 - 141*	*11/18/20 22:22*	*11/24/20 16:41*	*1*
Toluene-d8 (Surr)	*102*		*52 - 141*	*11/18/20 22:22*	*11/24/20 16:41*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
1,2,4,5-Tetrachlorobenzene	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,2'-oxybis[1-chloropropane]	ND		0.053	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4,5-Trichlorophenol	ND		0.082	0.037	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4,6-Trichlorophenol	ND		0.070	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4-Dichlorophenol	ND		0.053	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4-Dimethylphenol	ND		0.082	0.037	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4-Dinitrophenol	ND		1.2	0.41	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,4-Dinitrotoluene	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2,6-Dinitrotoluene	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Chloronaphthalene	ND		0.041	0.0082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Chlorophenol	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Methylnaphthalene	ND		0.041	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Methylphenol	ND		0.082	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Nitroaniline	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
2-Nitrophenol	ND		0.070	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
3,3'-Dichlorobenzidine	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
3-Nitroaniline	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4,6-Dinitro-2-methylphenol	ND		0.62	0.29	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Bromophenyl-phenylether	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Chloro-3-methylphenol	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Methylphenol, 3 & 4	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Nitroaniline	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Nitrophenol	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Acenaphthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Acenaphthylene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)

Date Collected: 11/17/20 13:45 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-4

Matrix: Soil
Percent Solids: 80.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetophenone	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Anthracene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Atrazine	ND		0.53	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzaldehyde	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzo[a]anthracene	ND		0.021	0.0082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzo[a]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzo[b]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzo[g,h,i]perylene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzo[k]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Bis(2-chloroethoxy)methane	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Bis(2-chloroethyl)ether	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Bis(2-ethylhexyl) phthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Butylbenzylphthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Caprolactam	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Carbazole	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Chrysene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Di-n-butyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Di-n-octyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Dibenz(a,h)anthracene	ND		0.021	0.0082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Dibenzofuran	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Diethyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Dimethyl phthalate	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Chloroaniline	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Fluorene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
4-Chlorophenyl-phenyl ether	ND		0.053	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Hexachlorobenzene	ND		0.021	0.0082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Hexachlorobutadiene	ND		0.094	0.045	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Hexachlorocyclopentadiene	ND		0.62	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Hexachloroethane	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Isophorone	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
N-Nitrosodi-n-propylamine	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
N-Nitrosodiphenylamine	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Naphthalene	ND		0.021	0.0082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Nitrobenzene	ND		0.082	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Phenanthrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Aniline	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Phenol	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Pentachlorophenol	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Benzyl alcohol	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Dicyclohexylamine	**1.9**	**J**	2.5	0.82	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
n,n'-Dimethylaniline	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Pyridine	ND		0.21	0.082	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
Triethylamine	ND	*- *1	6.2	2.1	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1
1,4-Dioxane	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 22:25	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.37*	*J N*	*mg/Kg*	☼	*1.77*		*11/24/20 16:27*	*11/25/20 22:25*	*1*

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)

Date Collected: 11/17/20 13:45
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment

Lab Sample ID: 410-21255-4

Matrix: Soil
Percent Solids: 80.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	0.99	TJ N	mg/Kg	☼	3.24		11/24/20 16:27	11/25/20 22:25	1
Unknown	12	TJB N	mg/Kg	☼	3.91		11/24/20 16:27	11/25/20 22:25	1
Unknown	0.29	TJ N	mg/Kg	☼	6.30		11/24/20 16:27	11/25/20 22:25	1
Unknown	0.32	TJ N	mg/Kg	☼	7.09		11/24/20 16:27	11/25/20 22:25	1
Unknown	0.45	TJ N	mg/Kg	☼	8.31		11/24/20 16:27	11/25/20 22:25	1
Unknown	0.27	TJ N	mg/Kg	☼	8.39		11/24/20 16:27	11/25/20 22:25	1
Unknown	0.19	TJ N	mg/Kg	☼	9.74		11/24/20 16:27	11/25/20 22:25	1
Unknown	0.47	TJ N	mg/Kg	☼	10.07		11/24/20 16:27	11/25/20 22:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	73		45 - 108	11/24/20 16:27	11/25/20 22:25	1
Nitrobenzene-d5 (Surr)	71		32 - 97	11/24/20 16:27	11/25/20 22:25	1
2-Fluorophenol (Surr)	82		26 - 96	11/24/20 16:27	11/25/20 22:25	1
2-Fluorobiphenyl (Surr)	73		39 - 100	11/24/20 16:27	11/25/20 22:25	1
2,4,6-Tribromophenol (Surr)	83		13 - 121	11/24/20 16:27	11/25/20 22:25	1
Phenol-d5 (Surr)	79		27 - 104	11/24/20 16:27	11/25/20 22:25	1

Compounds Dicyclohexylamine, n,n'-Dimethylamine and Triethylamine are reported from the "RE" analysis.

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
1,2,4,5-Tetrachlorobenzene	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2,2'-oxybis[1-chloropropane]	ND	H	0.053	0.024	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2,3,4,6-Tetrachlorophenol	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2,4,5-Trichlorophenol	ND	H	0.081	0.037	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2,4,6-Trichlorophenol	ND	H	0.069	0.033	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2,4-Dichlorophenol	ND	H	0.053	0.024	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2,4-Dimethylphenol	ND	H	0.081	0.037	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2,4-Dinitrophenol	ND	H	1.2	0.41	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2,4-Dinitrotoluene	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2,6-Dinitrotoluene	ND	H	0.061	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2-Chloronaphthalene	ND	H	0.041	0.0081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2-Chlorophenol	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2-Methylnaphthalene	ND	H	0.041	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2-Methylphenol	ND	H	0.081	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2-Nitroaniline	ND	H	0.061	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
2-Nitrophenol	ND	H	0.069	0.033	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
3,3'-Dichlorobenzidine	ND	H	0.41	0.12	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
3-Nitroaniline	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
4,6-Dinitro-2-methylphenol	ND	H	0.61	0.29	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
4-Bromophenyl-phenylether	ND	H	0.061	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
4-Chloro-3-methylphenol	ND	H	0.061	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Methylphenol, 3 & 4	ND	H	0.061	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
4-Nitroaniline	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
4-Nitrophenol	ND	H	0.61	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Acenaphthene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Acenaphthylene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Acetophenone	ND	H	0.061	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Anthracene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Atrazine	ND	H	0.53	0.24	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)
Lab Sample ID: 410-21255-4

Date Collected: 11/17/20 13:45 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 80.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzaldehyde	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Benzo[a]anthracene	ND	H	0.020	0.0081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Benzo[a]pyrene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Benzo[b]fluoranthene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Benzo[g,h,i]perylene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Benzo[k]fluoranthene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Bis(2-chloroethoxy)methane	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Bis(2-chloroethyl)ether	ND	H	0.061	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Bis(2-ethylhexyl) phthalate	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Butylbenzylphthalate	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Caprolactam	ND	H	0.20	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Carbazole	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Chrysene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Di-n-butyl phthalate	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Di-n-octyl phthalate	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Dibenz(a,h)anthracene	ND	H	0.020	0.0081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Dibenzofuran	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Diethyl phthalate	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Dimethyl phthalate	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Fluoranthene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
4-Chloroaniline	ND	H	0.20	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Fluorene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
4-Chlorophenyl-phenyl ether	ND	H	0.053	0.024	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Hexachlorobenzene	ND	H	0.020	0.0081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Hexachlorobutadiene	ND	H	0.094	0.045	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Hexachlorocyclopentadiene	ND	H	0.61	0.24	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Hexachloroethane	ND	H	0.20	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Indeno[1,2,3-cd]pyrene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Isophorone	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
N-Nitrosodi-n-propylamine	ND	H	0.061	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
N-Nitrosodiphenylamine	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Naphthalene	ND	H	0.020	0.0081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Nitrobenzene	ND	H	0.081	0.033	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Phenanthrene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Aniline	ND	H	0.61	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Phenol	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Pyrene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Pentachlorophenol	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Benzyl alcohol	ND	H	0.61	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Dicyclohexylamine	**1.8**	**J H** J	2.4	0.81	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
n,n'-Dimethylaniline	ND	H J	0.20	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Pyridine	ND	H	0.20	0.081	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1
Triethylamine	ND	H J	6.1	2.0	mg/Kg	☼	12/03/20 16:08	12/04/20 15:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*100*		*45 - 108*	*12/03/20 16:08*	*12/04/20 15:14*	*1*
Nitrobenzene-d5 (Surr)	*70*		*32 - 97*	*12/03/20 16:08*	*12/04/20 15:14*	*1*
2-Fluorophenol (Surr)	*77*		*26 - 96*	*12/03/20 16:08*	*12/04/20 15:14*	*1*
2-Fluorobiphenyl (Surr)	*80*		*39 - 100*	*12/03/20 16:08*	*12/04/20 15:14*	*1*
2,4,6-Tribromophenol (Surr)	*49*		*13 - 121*	*12/03/20 16:08*	*12/04/20 15:14*	*1*

Client Sample ID: B55-PDI-SB-18 (10.7-11.7)
Lab Sample ID: 410-21255-4

Date Collected: 11/17/20 13:45 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 80.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Phenol-d5 (Surr)	*77*		*27 - 104*	*12/03/20 16:08*	*12/04/20 15:14*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	*	0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:19	1
Formaldehyde	**0.069**	**J**	0.093	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:19	1
Glutaraldehyde	ND		0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*106*		*77 - 133*	*11/20/20 13:08*	*11/23/20 23:19*	*1*

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)
Lab Sample ID: 410-21255-5

Date Collected: 11/17/20 14:00 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**22.1**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)
Lab Sample ID: 410-21255-5

Date Collected: 11/17/20 14:00 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 77.9

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,1,2,2-Tetrachloroethane	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,1,2-Trichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,1-Dichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,1-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2,3-Trichlorobenzene	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2,4-Trichlorobenzene	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2,4-Trimethylbenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2-Dibromo-3-Chloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2-Dibromoethane	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2-Dichlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2-Dichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,2-Dichloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,3,5-Trimethylbenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,3-Dichlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,4-Dichlorobenzene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
1,4-Dioxane	ND		0.23	0.034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
2-Butanone	**0.0026**	**J**	0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
2-Hexanone	ND		0.0091	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
2-Nitropropane	ND		0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
4-Methyl-2-pentanone	ND		0.0091	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Acetone	**0.071**		0.018	0.0055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Acetonitrile	ND		0.091	0.023	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Benzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Bromochloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)

Date Collected: 11/17/20 14:00
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment

Lab Sample ID: 410-21255-5

Matrix: Soil
Percent Solids: 77.9

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromodichloromethane	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Bromoform	ND		0.0091	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Bromomethane	ND		0.0046	0.00064	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Carbon disulfide	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Carbon tetrachloride	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Chlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Chlorodifluoromethane	ND		0.0091	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Chloroethane	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Chloroform	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Chloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
cis-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
cis-1,3-Dichloropropene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Cyclohexane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Cyclohexanone	ND		0.23	0.023	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Dibromochloromethane	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Dichlorodifluoromethane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Ethyl acetate	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Ethyl ether	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Ethylbenzene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Freon 113	ND		0.0091	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Isobutyl alcohol	ND		0.23	0.035	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Isopropylbenzene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
m&p-Xylene	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Methyl acetate	ND		0.0046	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Methyl tertiary butyl ether	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Methylcyclohexane	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Methylene Chloride	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Naphthalene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
n-Butanol	ND		0.23	0.051	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
n-Butylbenzene	ND		0.0073	0.0027	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
n-Heptane	ND		0.0073	0.0027	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
o-Xylene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
p-Isopropyltoluene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
sec-Butylbenzene	ND		0.0046	0.0018	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Styrene	ND		0.0046	0.00036	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
t-Butyl alcohol	**0.073**	**J**	0.091	0.014	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
tert-Butylbenzene	ND		0.0046	0.00073	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Tetrachloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Tetrahydrofuran	ND		0.0073	0.00091	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Toluene	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
trans-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
trans-1,3-Dichloropropene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Trichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Trichlorofluoromethane	ND		0.0046	0.00064	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Vinyl chloride	ND		0.0046	0.00055	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1
Xylenes, Total	ND		0.0091	0.0013	mg/Kg	☼	11/18/20 22:22	11/24/20 17:03	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*	☼			*11/18/20 22:22*	*11/24/20 17:03*	*1*

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)

Lab Sample ID: 410-21255-5

Date Collected: 11/17/20 14:00 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 77.9

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/18/20 22:22*	*11/24/20 17:03*	*1*
4-Bromofluorobenzene (Surr)	*97*		*50 - 131*	*11/18/20 22:22*	*11/24/20 17:03*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/18/20 22:22*	*11/24/20 17:03*	*1*
Toluene-d8 (Surr)	*102*		*52 - 141*	*11/18/20 22:22*	*11/24/20 17:03*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
1,2,4,5-Tetrachlorobenzene	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,2'-oxybis[1-chloropropane]	ND		0.055	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4,5-Trichlorophenol	ND		0.084	0.038	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4,6-Trichlorophenol	ND		0.072	0.034	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4-Dichlorophenol	ND		0.055	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4-Dimethylphenol	ND		0.084	0.038	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4-Dinitrophenol	ND		1.3	0.42	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,4-Dinitrotoluene	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2,6-Dinitrotoluene	ND		0.063	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Chloronaphthalene	ND		0.042	0.0084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Chlorophenol	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Methylnaphthalene	ND		0.042	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Methylphenol	ND		0.084	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Nitroaniline	ND		0.063	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
2-Nitrophenol	ND		0.072	0.034	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
3,3'-Dichlorobenzidine	ND		0.42	0.13	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
3-Nitroaniline	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4,6-Dinitro-2-methylphenol	ND		0.63	0.29	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Bromophenyl-phenylether	ND		0.063	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Chloro-3-methylphenol	ND		0.063	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Methylphenol, 3 & 4	ND		0.063	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Nitroaniline	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Nitrophenol	ND		0.63	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Acenaphthene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Acenaphthylene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Acetophenone	ND		0.063	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Anthracene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Atrazine	ND		0.55	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzaldehyde	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzo[a]anthracene	ND		0.021	0.0084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzo[a]pyrene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzo[b]fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzo[g,h,i]perylene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzo[k]fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Bis(2-chloroethoxy)methane	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Bis(2-chloroethyl)ether	ND		0.063	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Bis(2-ethylhexyl) phthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Butylbenzylphthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Caprolactam	ND		0.21	0.042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Carbazole	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Chrysene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)
Lab Sample ID: 410-21255-5

Date Collected: 11/17/20 14:00 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 77.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Di-n-butyl phthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Di-n-octyl phthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Dibenz(a,h)anthracene	ND		0.021	0.0084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Dibenzofuran	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Diethyl phthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Dimethyl phthalate	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Chloroaniline	ND		0.21	0.042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Fluorene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
4-Chlorophenyl-phenyl ether	ND		0.055	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Hexachlorobenzene	ND		0.021	0.0084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Hexachlorobutadiene	ND		0.097	0.046	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Hexachlorocyclopentadiene	ND		0.63	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Hexachloroethane	ND		0.21	0.042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Isophorone	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
N-Nitrosodi-n-propylamine	ND		0.063	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
N-Nitrosodiphenylamine	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Naphthalene	ND		0.021	0.0084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Nitrobenzene	ND		0.084	0.034	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Phenanthrene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Aniline	ND		0.63	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Phenol	ND		0.046	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Pyrene	ND		0.021	0.0042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Pentachlorophenol	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Benzyl alcohol	ND		0.63	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
n,n'-Dimethylaniline	ND		0.21	0.042	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Pyridine	ND		0.21	0.084	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
Triethylamine	ND	*- *1	6.3	2.1	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1
1,4-Dioxane	ND		0.42	0.13	mg/Kg	☼	11/24/20 16:27	11/25/20 22:49	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*22*	*T J B N*	*mg/Kg*	☼	*3.29*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*23*	*T J N*	*mg/Kg*	☼	*3.91*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.24*	*T J N*	*mg/Kg*	☼	*4.46*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.27*	*T J N*	*mg/Kg*	☼	*5.01*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.19*	*T J N*	*mg/Kg*	☼	*5.44*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.54*	*T J N*	*mg/Kg*	☼	*5.45*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
1,2,4-Trithiolane	*1.4*	*T J N*	*mg/Kg*	☼	*6.20*	*289-16-7*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.26*	*T J N*	*mg/Kg*	☼	*6.30*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.17*	*T J N*	*mg/Kg*	☼	*6.99*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.23*	*T J N*	*mg/Kg*	☼	*7.09*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.17*	*T J N*	*mg/Kg*	☼	*7.85*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*3.4*	*T J N*	*mg/Kg*	☼	*8.22*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*1.4*	*T J N*	*mg/Kg*	☼	*8.40*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.58*	*T J N*	*mg/Kg*	☼	*8.44*		*11/24/20 16:27*	*11/25/20 22:49*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.54*	*T J N*	*mg/Kg*	☼	*8.60*	*7560-83-0*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
Lenthionine	*0.26*	*T J N*	*mg/Kg*	☼	*9.33*	*292-46-6*	*11/24/20 16:27*	*11/25/20 22:49*	*1*
Unknown	*0.64*	*T J N*	*mg/Kg*	☼	*9.75*		*11/24/20 16:27*	*11/25/20 22:49*	*1*

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)

Date Collected: 11/17/20 14:00
Date Collected is 11/16/20
Date Received: 11/18/20 11:46
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-5

Matrix: Soil
Percent Solids: 77.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	0.66	T J N	mg/Kg	☼	10.07		11/24/20 16:27	11/25/20 22:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	106		45 - 108	11/24/20 16:27	11/25/20 22:49	1
Nitrobenzene-d5 (Surr)	65		32 - 97	11/24/20 16:27	11/25/20 22:49	1
2-Fluorophenol (Surr)	83		26 - 96	11/24/20 16:27	11/25/20 22:49	1
2-Fluorobiphenyl (Surr)	82		39 - 100	11/24/20 16:27	11/25/20 22:49	1
2,4,6-Tribromophenol (Surr)	69		13 - 121	11/24/20 16:27	11/25/20 22:49	1
Phenol-d5 (Surr)	87		27 - 104	11/24/20 16:27	11/25/20 22:49	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
~~Dicyclohexylamine~~	12		7.6	2.5	mg/Kg	☼	11/24/20 16:27	11/30/20 15:54	3

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	82		45 - 108	11/24/20 16:27	11/30/20 15:54	3
Nitrobenzene-d5 (Surr)	52		32 - 97	11/24/20 16:27	11/30/20 15:54	3
2-Fluorophenol (Surr)	62		26 - 96	11/24/20 16:27	11/30/20 15:54	3
2-Fluorobiphenyl (Surr)	64		39 - 100	11/24/20 16:27	11/30/20 15:54	3
2,4,6-Tribromophenol (Surr)	51		13 - 121	11/24/20 16:27	11/30/20 15:54	3
Phenol-d5 (Surr)	63		27 - 104	11/24/20 16:27	11/30/20 15:54	3

Compounds Dicyclohexylamine, n,n'-Dimethylamine and Triethylamine are reported from the "RE" analysis.

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND	H	0.046	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
1,2,4,5-Tetrachlorobenzene	ND	H	0.046	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2,2'-oxybis[1-chloropropane]	ND	H	0.055	0.025	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2,3,4,6-Tetrachlorophenol	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2,4,5-Trichlorophenol	ND	H	0.084	0.038	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2,4,6-Trichlorophenol	ND	H	0.072	0.034	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2,4-Dichlorophenol	ND	H	0.055	0.025	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2,4-Dimethylphenol	ND	H	0.084	0.038	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2,4-Dinitrophenol	ND	H	1.3	0.42	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2,4-Dinitrotoluene	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2,6-Dinitrotoluene	ND	H	0.063	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2-Chloronaphthalene	ND	H	0.042	0.0084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2-Chlorophenol	ND	H	0.046	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2-Methylnaphthalene	ND	H	0.042	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2-Methylphenol	ND	H	0.084	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2-Nitroaniline	ND	H	0.063	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
2-Nitrophenol	ND	H	0.072	0.034	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
3,3'-Dichlorobenzidine	ND	H	0.42	0.13	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
3-Nitroaniline	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
4,6-Dinitro-2-methylphenol	ND	H	0.63	0.29	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
4-Bromophenyl-phenylether	ND	H	0.063	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
4-Chloro-3-methylphenol	ND	H	0.063	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Methylphenol, 3 & 4	ND	H	0.063	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
4-Nitroaniline	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
4-Nitrophenol	ND	H	0.63	0.21	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Acenaphthene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)
Lab Sample ID: 410-21255-5

Date Collected: 11/17/20 14:00 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 77.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthylene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Acetophenone	ND	H	0.063	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Anthracene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Atrazine	ND	H	0.55	0.25	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Benzaldehyde	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Benzo[a]anthracene	ND	H	0.021	0.0084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Benzo[a]pyrene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Benzo[b]fluoranthene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Benzo[g,h,i]perylene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Benzo[k]fluoranthene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Bis(2-chloroethoxy)methane	ND	H	0.046	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Bis(2-chloroethyl)ether	ND	H	0.063	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Bis(2-ethylhexyl) phthalate	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Butylbenzylphthalate	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Caprolactam	ND	H	0.21	0.042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Carbazole	ND	H	0.046	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Chrysene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Di-n-butyl phthalate	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Di-n-octyl phthalate	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Dibenz(a,h)anthracene	ND	H	0.021	0.0084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Dibenzofuran	ND	H	0.046	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Diethyl phthalate	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Dimethyl phthalate	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Fluoranthene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
4-Chloroaniline	ND	H	0.21	0.042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Fluorene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
4-Chlorophenyl-phenyl ether	ND	H	0.055	0.025	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Hexachlorobenzene	ND	H	0.021	0.0084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Hexachlorobutadiene	ND	H	0.097	0.046	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Hexachlorocyclopentadiene	ND	H	0.63	0.25	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Hexachloroethane	ND	H	0.21	0.042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Indeno[1,2,3-cd]pyrene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Isophorone	ND	H	0.046	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
N-Nitrosodi-n-propylamine	ND	H	0.063	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
N-Nitrosodiphenylamine	ND	H	0.046	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Naphthalene	ND	H	0.021	0.0084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Nitrobenzene	ND	H	0.084	0.034	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Phenanthrene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Aniline	ND	H	0.63	0.21	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Phenol	ND	H	0.046	0.021	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Pyrene	ND	H	0.021	0.0042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Pentachlorophenol	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Benzyl alcohol	ND	H	0.63	0.21	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Dicyclohexylamine	**13**	~~H~~ E	2.5	0.84	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
n,n'-Dimethylaniline	ND	~~H~~	0.21	0.042	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Pyridine	ND	H	0.21	0.084	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1
Triethylamine	ND	~~H * *1~~	6.3	2.1	mg/Kg	☼	12/03/20 16:08	12/04/20 15:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*98*		*45 - 108*	*12/03/20 16:08*	*12/04/20 15:38*	*1*

Client Sample ID: B55-PDI-SB-19 (12.6-13.6)
Lab Sample ID: 410-21255-5

Date Collected: 11/17/20 14:00 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 77.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*61*		*32 - 97*	*12/03/20 16:08*	*12/04/20 15:38*	*1*
2-Fluorophenol (Surr)	*78*		*26 - 96*	*12/03/20 16:08*	*12/04/20 15:38*	*1*
2-Fluorobiphenyl (Surr)	*78*		*39 - 100*	*12/03/20 16:08*	*12/04/20 15:38*	*1*
2,4,6-Tribromophenol (Surr)	*51*		*13 - 121*	*12/03/20 16:08*	*12/04/20 15:38*	*1*
Phenol-d5 (Surr)	*79*		*27 - 104*	*12/03/20 16:08*	*12/04/20 15:38*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	*	0.064	0.032	mg/Kg	☼	11/20/20 13:08	11/23/20 23:30	1
Formaldehyde	**0.16**		0.096	0.032	mg/Kg	☼	11/20/20 13:08	11/23/20 23:30	1
Glutaraldehyde	ND		0.064	0.032	mg/Kg	☼	11/20/20 13:08	11/23/20 23:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*107*		*77 - 133*	*11/20/20 13:08*	*11/23/20 23:30*	*1*

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Lab Sample ID: 410-21255-6

Date Collected: 11/17/20 14:05 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**19.6**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Lab Sample ID: 410-21255-6

Date Collected: 11/17/20 14:05 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 80.4

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
trans-1,3-Dichloropropene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Ethylbenzene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Styrene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,4-Dichlorobenzene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2-Dibromoethane	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2-Dichloroethane	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
4-Methyl-2-pentanone	ND		0.62	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Methylcyclohexane	**0.55**		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Toluene	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Chlorobenzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2,4-Trimethylbenzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Cyclohexane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2,4-Trichlorobenzene	ND		0.62	0.31	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,4-Dioxane	ND		15	2.3	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Dibromochloromethane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Tetrachloroethene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
cis-1,2-Dichloroethene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
trans-1,2-Dichloroethene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Methyl tertiary butyl ether	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
m&p-Xylene	ND		0.31	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Lab Sample ID: 410-21255-6

Date Collected: 11/17/20 14:05 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 80.4

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3,5-Trimethylbenzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,3-Dichlorobenzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Carbon tetrachloride	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
2-Hexanone	ND		0.62	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Acetone	ND		1.2	0.37	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Chloroform	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Benzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,1,1-Trichloroethane	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Bromomethane	ND		0.31	0.043	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Chloromethane	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Bromochloromethane	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Chloroethane	ND		0.31	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Vinyl chloride	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Methylene Chloride	ND		0.31	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Carbon disulfide	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Bromoform	ND		0.62	0.31	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Bromodichloromethane	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,1-Dichloroethane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,1-Dichloroethene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Trichlorofluoromethane	ND		0.31	0.043	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Dichlorodifluoromethane	ND		0.31	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Freon 113	ND		0.62	0.037	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2-Dichloropropane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
2-Butanone	ND		0.62	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,1,2-Trichloroethane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
2-Nitropropane	~~ND~~	R	~~0.62~~	~~0.12~~	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Trichloroethene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Methyl acetate	ND		0.31	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,1,2,2-Tetrachloroethane	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2,3-Trichlorobenzene	ND		0.62	0.31	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
o-Xylene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2-Dichlorobenzene	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
1,2-Dibromo-3-Chloropropane	ND		0.31	0.031	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Acetonitrile	ND		6.2	1.5	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Isopropylbenzene	ND		0.31	0.025	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Chlorodifluoromethane	ND		0.62	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Cyclohexanone	ND		15	1.5	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Ethyl acetate	ND		0.31	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Ethyl ether	ND		0.31	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Isobutyl alcohol	ND		15	2.3	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Naphthalene	ND		0.31	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
n-Butanol	ND		15	3.5	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
n-Butylbenzene	ND		0.49	0.19	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
n-Heptane	**0.86**		0.49	0.19	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
p-Isopropyltoluene	ND		0.31	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
sec-Butylbenzene	ND		0.31	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
t-Butyl alcohol	ND		6.2	0.93	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
tert-Butylbenzene	ND		0.31	0.049	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50
Tetrahydrofuran	ND		0.49	0.062	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Lab Sample ID: 410-21255-6

Date Collected: 11/17/20 14:05
Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date
Matrix: Soil

Date Received: 11/18/20 11:46
Percent Solids: 80.4

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	ND		0.62	0.086	mg/Kg	☼	11/19/20 20:14	11/25/20 01:04	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Hexane, 3-methyl-	*0.48*	*T J N*	*mg/Kg*	☼	*7.30*	*589-34-4*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Heptane, 3-methyl-	*0.43*	*T J N*	*mg/Kg*	☼	*9.63*	*589-81-1*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Unknown	*0.42*	*T J N*	*mg/Kg*	☼	*10.12*		*11/19/20 20:14*	*11/25/20 01:04*	*50*
Unknown	*0.38*	*T J N*	*mg/Kg*	☼	*11.12*		*11/19/20 20:14*	*11/25/20 01:04*	*50*
Benzene, 1-ethyl-2,4-dimethyl-	*0.80*	*T J N*	*mg/Kg*	☼	*13.68*	*874-41-9*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Benzene, 1,2,4,5-tetramethyl-	*0.79*	*T J N*	*mg/Kg*	☼	*13.96*	*95-93-2*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Unknown	*0.41*	*T J N*	*mg/Kg*	☼	*14.22*		*11/19/20 20:14*	*11/25/20 01:04*	*50*
Unknown	*0.61*	*T J N*	*mg/Kg*	☼	*14.29*		*11/19/20 20:14*	*11/25/20 01:04*	*50*
Benzene, (1-methyl-1-butenyl)-	*0.57*	*T J N*	*mg/Kg*	☼	*14.51*	*53172-84-2*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
1H-Indene, 2,3-dihydro-1,3-dimethyl-	*0.59*	*T J N*	*mg/Kg*	☼	*14.60*	*4175-53-5*	*11/19/20 20:14*	*11/25/20 01:04*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*54 - 135*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
4-Bromofluorobenzene (Surr)	*85*		*50 - 131*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Dibromofluoromethane (Surr)	*81*		*50 - 141*	*11/19/20 20:14*	*11/25/20 01:04*	*50*
Toluene-d8 (Surr)	*83*		*52 - 141*	*11/19/20 20:14*	*11/25/20 01:04*	*50*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
1,2,4,5-Tetrachlorobenzene	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,2'-oxybis[1-chloropropane]	ND		0.054	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4,5-Trichlorophenol	ND		0.083	0.037	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4,6-Trichlorophenol	ND		0.070	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4-Dichlorophenol	ND		0.054	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4-Dimethylphenol	ND		0.083	0.037	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4-Dinitrophenol	ND		1.2	0.41	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,4-Dinitrotoluene	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2,6-Dinitrotoluene	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Chloronaphthalene	ND		0.041	0.0083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Chlorophenol	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Methylnaphthalene	**0.0061**	**J**	0.041	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Methylphenol	ND		0.083	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Nitroaniline	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
2-Nitrophenol	ND		0.070	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
3,3'-Dichlorobenzidine	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
3-Nitroaniline	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4,6-Dinitro-2-methylphenol	ND		0.62	0.29	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Bromophenyl-phenylether	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Chloro-3-methylphenol	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Methylphenol, 3 & 4	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Nitroaniline	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Nitrophenol	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Acenaphthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Acenaphthylene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Acetophenone	ND		0.062	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Lab Sample ID: 410-21255-6

Date Collected: 11/17/20 14:05 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 80.4

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anthracene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Atrazine	ND		0.54	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzaldehyde	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzo[a]anthracene	ND		0.021	0.0083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzo[a]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzo[b]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzo[g,h,i]perylene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzo[k]fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Bis(2-chloroethoxy)methane	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Bis(2-chloroethyl)ether	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Bis(2-ethylhexyl) phthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Butylbenzylphthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Caprolactam	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Carbazole	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Chrysene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Di-n-butyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Di-n-octyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Dibenz(a,h)anthracene	ND		0.021	0.0083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Dibenzofuran	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Diethyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Dimethyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Fluoranthene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Chloroaniline	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Fluorene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
4-Chlorophenyl-phenyl ether	ND		0.054	0.025	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Hexachlorobenzene	ND		0.021	0.0083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Hexachlorobutadiene	ND		0.095	0.045	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Hexachlorocyclopentadiene	ND		0.62	0.25	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Hexachloroethane	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Isophorone	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
N-Nitrosodi-n-propylamine	ND		0.062	0.029	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
N-Nitrosodiphenylamine	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Naphthalene	ND		0.021	0.0083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Nitrobenzene	ND		0.083	0.033	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Phenanthrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Aniline	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Phenol	ND		0.045	0.021	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Pyrene	ND		0.021	0.0041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Pentachlorophenol	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Benzyl alcohol	ND		0.62	0.21	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
n,n'-Dimethylaniline	ND		0.21	0.041	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Pyridine	ND		0.21	0.083	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
Triethylamine	ND	*- *1	6.2	2.1	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1
1,4-Dioxane	ND		0.41	0.12	mg/Kg	☼	11/24/20 16:27	11/25/20 23:13	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.0*	*T J N*	*mg/Kg*	☼	*3.24*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
Unknown	*5.0*	*T J B N*	*mg/Kg*	☼	*3.90*		*11/24/20 16:27*	*11/25/20 23:13*	*1*
2-Cyclohexen-1-one	*0.22*	*T J N*	*mg/Kg*	☼	*4.81*	*930-68-7*	*11/24/20 16:27*	*11/25/20 23:13*	*1*

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Date Collected: 11/17/20 14:05
Date Received: 11/18/20 11:46

Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21255-6
Matrix: Soil
Percent Solids: 80.4

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	0.17	T J N	mg/Kg	☼	5.02		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.18	T J N	mg/Kg	☼	5.87		11/24/20 16:27	11/25/20 23:13	1
1,2,4-Trithiolane	0.40	T J N	mg/Kg	☼	6.19	289-16-7	11/24/20 16:27	11/25/20 23:13	1
Unknown	0.25	T J N	mg/Kg	☼	7.01		11/24/20 16:27	11/25/20 23:13	1
Cyclohexane, isothiocyanato-	0.24	T J N	mg/Kg	☼	7.05	1122-82-3	11/24/20 16:27	11/25/20 23:13	1
Unknown	0.49	T J N	mg/Kg	☼	7.09		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.81	T J N	mg/Kg	☼	8.25		11/24/20 16:27	11/25/20 23:13	1
Unknown	2.7	T J N	mg/Kg	☼	8.31		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.43	T J N	mg/Kg	☼	8.37		11/24/20 16:27	11/25/20 23:13	1
Unknown	1.9	T J N	mg/Kg	☼	8.40		11/24/20 16:27	11/25/20 23:13	1
Unknown	1.1	T J N	mg/Kg	☼	8.52		11/24/20 16:27	11/25/20 23:13	1
Cyclohexanamine, N-cyclohexyl-N-methyl-	0.60	T J N	mg/Kg	☼	8.61	7560-83-0	11/24/20 16:27	11/25/20 23:13	1
Unknown	0.38	T J N	mg/Kg	☼	8.75		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.22	T J N	mg/Kg	☼	8.87		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.76	T J N	mg/Kg	☼	8.89		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.22	T J N	mg/Kg	☼	9.17		11/24/20 16:27	11/25/20 23:13	1
Lenthionine	0.69	T J N	mg/Kg	☼	9.33	292-46-6	11/24/20 16:27	11/25/20 23:13	1
Unknown	0.31	T J N	mg/Kg	☼	9.37		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.25	T J N	mg/Kg	☼	9.67		11/24/20 16:27	11/25/20 23:13	1
Unknown	2.0	T J N	mg/Kg	☼	9.75		11/24/20 16:27	11/25/20 23:13	1
Unknown	0.30	T J N	mg/Kg	☼	10.07		11/24/20 16:27	11/25/20 23:13	1
Cyclic octaatomic sulfur	0.34	T J N	mg/Kg	☼	11.14	10544-50-0	11/24/20 16:27	11/25/20 23:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	106		45 - 108	11/24/20 16:27	11/25/20 23:13	1
Nitrobenzene-d5 (Surr)	74		32 - 97	11/24/20 16:27	11/25/20 23:13	1
2-Fluorophenol (Surr)	87		26 - 96	11/24/20 16:27	11/25/20 23:13	1
2-Fluorobiphenyl (Surr)	84		39 - 100	11/24/20 16:27	11/25/20 23:13	1
2,4,6-Tribromophenol (Surr)	81		13 - 121	11/24/20 16:27	11/25/20 23:13	1
Phenol-d5 (Surr)	89		27 - 104	11/24/20 16:27	11/25/20 23:13	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	7.7		7.4	2.5	mg/Kg	☼	11/24/20 16:27	12/02/20 16:32	3

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	83		45 - 108	11/24/20 16:27	12/02/20 16:32	3
Nitrobenzene-d5 (Surr)	61		32 - 97	11/24/20 16:27	12/02/20 16:32	3
2-Fluorophenol (Surr)	63		26 - 96	11/24/20 16:27	12/02/20 16:32	3
2-Fluorobiphenyl (Surr)	67		39 - 100	11/24/20 16:27	12/02/20 16:32	3
2,4,6-Tribromophenol (Surr)	57		13 - 121	11/24/20 16:27	12/02/20 16:32	3
Phenol-d5 (Surr)	65		27 - 104	11/24/20 16:27	12/02/20 16:32	3

Compounds Dicyclohexylamine, n,n'-Dimethylamine and Triethylamine are reported from the "RE" analysis.

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
1,2,4,5-Tetrachlorobenzene	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2,2'-oxybis[1-chloropropane]	ND	H	0.053	0.024	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2,3,4,6-Tetrachlorophenol	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Lab Sample ID: 410-21255-6

Date Collected: 11/17/20 14:05 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 80.4

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-Trichlorophenol	ND	H	0.082	0.037	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2,4,6-Trichlorophenol	ND	H	0.069	0.033	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2,4-Dichlorophenol	ND	H	0.053	0.024	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2,4-Dimethylphenol	ND	H	0.082	0.037	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2,4-Dinitrophenol	ND	H	1.2	0.41	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2,4-Dinitrotoluene	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2,6-Dinitrotoluene	ND	H	0.061	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2-Chloronaphthalene	ND	H	0.041	0.0082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2-Chlorophenol	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2-Methylnaphthalene	**0.0067**	**J H**	0.041	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2-Methylphenol	ND	H	0.082	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2-Nitroaniline	ND	H	0.061	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
2-Nitrophenol	ND	H	0.069	0.033	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
3,3'-Dichlorobenzidine	ND	H	0.41	0.12	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
3-Nitroaniline	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
4,6-Dinitro-2-methylphenol	ND	H	0.61	0.29	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
4-Bromophenyl-phenylether	ND	H	0.061	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
4-Chloro-3-methylphenol	ND	H	0.061	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Methylphenol, 3 & 4	ND	H	0.061	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
4-Nitroaniline	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
4-Nitrophenol	ND	H	0.61	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Acenaphthene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Acenaphthylene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Acetophenone	ND	H	0.061	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Anthracene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Atrazine	ND	H	0.53	0.24	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Benzaldehyde	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Benzo[a]anthracene	ND	H	0.020	0.0082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Benzo[a]pyrene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Benzo[b]fluoranthene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Benzo[g,h,i]perylene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Benzo[k]fluoranthene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Bis(2-chloroethoxy)methane	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Bis(2-chloroethyl)ether	ND	H	0.061	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Bis(2-ethylhexyl) phthalate	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Butylbenzylphthalate	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Caprolactam	ND	H	0.20	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Carbazole	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Chrysene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Di-n-butyl phthalate	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Di-n-octyl phthalate	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Dibenz(a,h)anthracene	ND	H	0.020	0.0082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Dibenzofuran	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Diethyl phthalate	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Dimethyl phthalate	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Fluoranthene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
4-Chloroaniline	ND	H	0.20	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Fluorene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
4-Chlorophenyl-phenyl ether	ND	H	0.053	0.024	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1

Client Sample ID: B55-PDI-SB-18 (9.5-10.5)
Lab Sample ID: 410-21255-6

Date Collected: 11/17/20 14:05 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 80.4

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachlorobenzene	ND	H	0.020	0.0082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Hexachlorobutadiene	ND	H	0.094	0.045	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Hexachlorocyclopentadiene	ND	H	0.61	0.24	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Hexachloroethane	ND	H	0.20	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Indeno[1,2,3-cd]pyrene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Isophorone	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
N-Nitrosodi-n-propylamine	ND	H	0.061	0.029	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
N-Nitrosodiphenylamine	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Naphthalene	ND	H	0.020	0.0082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Nitrobenzene	ND	H	0.082	0.033	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Phenanthrene	**0.0084**	**J H**	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Aniline	ND	H	0.61	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Phenol	ND	H	0.045	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Pyrene	ND	H	0.020	0.0041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Pentachlorophenol	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Benzyl alcohol	ND	H	0.61	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Dicyclohexylamine	**13**	**H E** J	2.4	0.82	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
n,n'-Dimethylaniline	ND	H J	0.20	0.041	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Pyridine	ND	H	0.20	0.082	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1
Triethylamine	ND	H J	6.1	2.0	mg/Kg	☼	12/03/20 16:08	12/04/20 16:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*100*		*45 - 108*	*12/03/20 16:08*	*12/04/20 16:02*	*1*
Nitrobenzene-d5 (Surr)	*66*		*32 - 97*	*12/03/20 16:08*	*12/04/20 16:02*	*1*
2-Fluorophenol (Surr)	*78*		*26 - 96*	*12/03/20 16:08*	*12/04/20 16:02*	*1*
2-Fluorobiphenyl (Surr)	*80*		*39 - 100*	*12/03/20 16:08*	*12/04/20 16:02*	*1*
2,4,6-Tribromophenol (Surr)	*44*		*13 - 121*	*12/03/20 16:08*	*12/04/20 16:02*	*1*
Phenol-d5 (Surr)	*81*		*27 - 104*	*12/03/20 16:08*	*12/04/20 16:02*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	*	0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:42	1
Formaldehyde	**0.083**	**J**	0.093	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:42	1
Glutaraldehyde	ND		0.062	0.031	mg/Kg	☼	11/20/20 13:08	11/23/20 23:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*116*		*77 - 133*	*11/20/20 13:08*	*11/23/20 23:42*	*1*

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)
Lab Sample ID: 410-21255-7

Date Collected: 11/17/20 14:15
Date Received: 11/18/20 11:46

Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**14.2**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)

Date Collected: 11/17/20 14:15
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-7

Matrix: Soil
Percent Solids: 85.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,1,2,2-Tetrachloroethane	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,1,2-Trichloroethane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,1-Dichloroethane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,1-Dichloroethene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2,3-Trichlorobenzene	ND		0.0076	0.0038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2,4-Trichlorobenzene	ND		0.0076	0.0038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2,4-Trimethylbenzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2-Dibromo-3-Chloropropane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2-Dibromoethane	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2-Dichlorobenzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2-Dichloroethane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,2-Dichloropropane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,3,5-Trimethylbenzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,3-Dichlorobenzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,4-Dichlorobenzene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
1,4-Dioxane	ND		0.19	0.028	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
2-Butanone	ND		0.0076	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
2-Hexanone	ND		0.0076	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
2-Nitropropane	ND		0.0076	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
4-Methyl-2-pentanone	ND		0.0076	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Acetone	**0.022**		0.015	0.0046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Acetonitrile	ND		0.076	0.019	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Benzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Bromochloromethane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Bromodichloromethane	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Bromoform	ND		0.0076	0.0038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Bromomethane	ND		0.0038	0.00054	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Carbon disulfide	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Carbon tetrachloride	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Chlorobenzene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Chlorodifluoromethane	ND		0.0076	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Chloroethane	ND		0.0038	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Chloroform	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Chloromethane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
cis-1,2-Dichloroethene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
cis-1,3-Dichloropropene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Cyclohexane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Cyclohexanone	ND		0.19	0.019	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Dibromochloromethane	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Dichlorodifluoromethane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Ethyl acetate	ND		0.0038	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Ethyl ether	ND		0.0038	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Ethylbenzene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Freon 113	ND		0.0076	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Isobutyl alcohol	ND		0.19	0.029	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Isopropylbenzene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
m&p-Xylene	ND		0.0038	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Methyl acetate	ND		0.0038	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)
Lab Sample ID: 410-21255-7

Date Collected: 11/17/20 14:15
Matrix: Soil

Date Received: 11/18/20 11:46
Percent Solids: 85.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Methylcyclohexane	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Methylene Chloride	ND		0.0038	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Naphthalene	ND		0.0038	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
n-Butanol	ND		0.19	0.043	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
n-Butylbenzene	ND		0.0061	0.0023	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
n-Heptane	ND		0.0061	0.0023	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
o-Xylene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
p-Isopropyltoluene	ND		0.0038	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
sec-Butylbenzene	ND		0.0038	0.0015	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Styrene	ND		0.0038	0.00031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
t-Butyl alcohol	ND		0.076	0.011	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
tert-Butylbenzene	ND		0.0038	0.00061	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Tetrachloroethene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Tetrahydrofuran	ND		0.0061	0.00076	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Toluene	~~0.00053 J~~	0.0038 UB	0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
trans-1,2-Dichloroethene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
trans-1,3-Dichloropropene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Trichloroethene	ND		0.0038	0.00038	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Trichlorofluoromethane	ND		0.0038	0.00054	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Vinyl chloride	ND		0.0038	0.00046	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1
Xylenes, Total	ND		0.0076	0.0011	mg/Kg	☼	11/18/20 22:22	11/24/20 17:25	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*	☼			*11/18/20 22:22*	*11/24/20 17:25*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*54 - 135*	*11/18/20 22:22*	*11/24/20 17:25*	*1*
4-Bromofluorobenzene (Surr)	*96*		*50 - 131*	*11/18/20 22:22*	*11/24/20 17:25*	*1*
Dibromofluoromethane (Surr)	*100*		*50 - 141*	*11/18/20 22:22*	*11/24/20 17:25*	*1*
Toluene-d8 (Surr)	*101*		*52 - 141*	*11/18/20 22:22*	*11/24/20 17:25*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
1,2,4,5-Tetrachlorobenzene	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,2'-oxybis[1-chloropropane]	ND		0.050	0.023	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,3,4,6-Tetrachlorophenol	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4,5-Trichlorophenol	ND		0.076	0.034	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4,6-Trichlorophenol	ND		0.065	0.031	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4-Dichlorophenol	ND		0.050	0.023	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4-Dimethylphenol	ND		0.076	0.034	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4-Dinitrophenol	ND		1.1	0.38	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,4-Dinitrotoluene	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2,6-Dinitrotoluene	ND		0.057	0.027	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Chloronaphthalene	ND		0.038	0.0076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Chlorophenol	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Methylnaphthalene	ND		0.038	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Methylphenol	ND		0.076	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
2-Nitroaniline	ND		0.057	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)
Lab Sample ID: 410-21255-7

Date Collected: 11/17/20 14:15
Matrix: Soil

Date Received: 11/18/20 11:46
Percent Solids: 85.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	ND		0.065	0.031	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
3,3'-Dichlorobenzidine	ND		0.38	0.11	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
3-Nitroaniline	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4,6-Dinitro-2-methylphenol	ND		0.57	0.27	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Bromophenyl-phenylether	ND		0.057	0.027	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Chloro-3-methylphenol	ND		0.057	0.027	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Methylphenol, 3 & 4	ND		0.057	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Nitroaniline	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Nitrophenol	ND		0.57	0.19	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Acenaphthene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Acenaphthylene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Acetophenone	ND		0.057	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Anthracene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Atrazine	ND		0.50	0.23	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzaldehyde	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzo[a]anthracene	ND		0.019	0.0076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzo[a]pyrene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzo[b]fluoranthene	**0.0044**	**J**	0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzo[g,h,i]perylene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzo[k]fluoranthene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Bis(2-chloroethoxy)methane	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Bis(2-chloroethyl)ether	ND		0.057	0.027	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Bis(2-ethylhexyl) phthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Butylbenzylphthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Caprolactam	ND		0.19	0.038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Carbazole	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Chrysene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Di-n-butyl phthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Di-n-octyl phthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Dibenz(a,h)anthracene	ND		0.019	0.0076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Dibenzofuran	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Diethyl phthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Dimethyl phthalate	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Fluoranthene	**0.0046**	**J**	0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Chloroaniline	ND		0.19	0.038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Fluorene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
4-Chlorophenyl-phenyl ether	ND		0.050	0.023	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Hexachlorobenzene	ND		0.019	0.0076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Hexachlorobutadiene	ND		0.088	0.042	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Hexachlorocyclopentadiene	ND		0.57	0.23	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Hexachloroethane	ND		0.19	0.038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Indeno[1,2,3-cd]pyrene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Isophorone	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
N-Nitrosodi-n-propylamine	ND		0.057	0.027	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
N-Nitrosodiphenylamine	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Naphthalene	ND		0.019	0.0076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Nitrobenzene	ND		0.076	0.031	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Phenanthrene	ND		0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Aniline	ND		0.57	0.19	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)
Lab Sample ID: 410-21255-7

Date Collected: 11/17/20 14:15
Matrix: Soil

Date Received: 11/18/20 11:46
Percent Solids: 85.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenol	ND		0.042	0.019	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Pyrene	**0.0074**	**J**	0.019	0.0038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Pentachlorophenol	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Benzyl alcohol	ND		0.57	0.19	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Dicyclohexylamine	**4.4**		2.3	0.76	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
n,n'-Dimethylaniline	ND		0.19	0.038	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Pyridine	ND		0.19	0.076	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
Triethylamine	ND	*- *1	5.7	1.9	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1
1,4-Dioxane	ND		0.38	0.11	mg/Kg	☼	11/24/20 16:27	11/30/20 20:43	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*4.5*	*T J N*	*mg/Kg*	☼	*3.20*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*5.6*	*T J B N*	*mg/Kg*	☼	*3.84*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.38*	*T J N*	*mg/Kg*	☼	*4.97*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Cyclotetrasiloxane, octamethyl-	*0.15*	*T J N*	*mg/Kg*	☼	*5.19*	*556-67-2*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.43*	*T J N*	*mg/Kg*	☼	*5.39*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
1,2,4-Trithiolane	*0.59*	*T J N*	*mg/Kg*	☼	*6.14*	*289-16-7*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.15*	*T J N*	*mg/Kg*	☼	*6.25*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.29*	*T J N*	*mg/Kg*	☼	*7.04*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
1,2,4,5-Tetrathiane	*0.57*	*T J N*	*mg/Kg*	☼	*7.80*	*291-22-5*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*1.1*	*T J N*	*mg/Kg*	☼	*8.21*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.34*	*T J N*	*mg/Kg*	☼	*8.25*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.66*	*T J N*	*mg/Kg*	☼	*8.29*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Lenthionine	*1.8*	*T J N*	*mg/Kg*	☼	*9.28*	*292-46-6*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.79*	*T J N*	*mg/Kg*	☼	*9.69*		*11/24/20 16:27*	*11/30/20 20:43*	*1*
Unknown	*0.76*	*T J N*	*mg/Kg*	☼	*10.02*		*11/24/20 16:27*	*11/30/20 20:43*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*102*		*45 - 108*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Nitrobenzene-d5 (Surr)	*68*		*32 - 97*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
2-Fluorophenol (Surr)	*84*		*26 - 96*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
2-Fluorobiphenyl (Surr)	*85*		*39 - 100*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
2,4,6-Tribromophenol (Surr)	*65*		*13 - 121*	*11/24/20 16:27*	*11/30/20 20:43*	*1*
Phenol-d5 (Surr)	*87*		*27 - 104*	*11/24/20 16:27*	*11/30/20 20:43*	*1*

Compounds Dicyclohexylamine, n,n'-Dimethylamine and Triethylamine are reported from the "RE" analysis.

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND	H	0.042	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
1,2,4,5-Tetrachlorobenzene	ND	H	0.042	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2,2'-oxybis[1-chloropropane]	ND	H	0.050	0.023	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2,3,4,6-Tetrachlorophenol	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2,4,5-Trichlorophenol	ND	H	0.077	0.035	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2,4,6-Trichlorophenol	ND	H	0.065	0.031	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2,4-Dichlorophenol	ND	H	0.050	0.023	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2,4-Dimethylphenol	ND	H	0.077	0.035	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2,4-Dinitrophenol	ND	H	1.2	0.38	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2,4-Dinitrotoluene	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2,6-Dinitrotoluene	ND	H	0.058	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2-Chloronaphthalene	ND	H	0.038	0.0077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2-Chlorophenol	ND	H	0.042	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)
Lab Sample ID: 410-21255-7

Date Collected: 11/17/20 14:15
Matrix: Soil

Date Received: 11/18/20 11:46
Percent Solids: 85.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	ND	H	0.038	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2-Methylphenol	ND	H	0.077	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2-Nitroaniline	ND	H	0.058	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
2-Nitrophenol	ND	H	0.065	0.031	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
3,3'-Dichlorobenzidine	ND	H	0.38	0.12	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
3-Nitroaniline	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
4,6-Dinitro-2-methylphenol	ND	H	0.58	0.27	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
4-Bromophenyl-phenylether	ND	H	0.058	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
4-Chloro-3-methylphenol	ND	H	0.058	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Methylphenol, 3 & 4	ND	H	0.058	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
4-Nitroaniline	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
4-Nitrophenol	ND	H	0.58	0.19	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Acenaphthene	ND	H	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Acenaphthylene	ND	H	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Acetophenone	ND	H	0.058	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Anthracene	ND	H	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Atrazine	ND	H	0.50	0.23	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Benzaldehyde	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Benzo[a]anthracene	ND	H	0.019	0.0077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Benzo[a]pyrene	**0.0043**	**J H**	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Benzo[b]fluoranthene	**0.0056**	**J H**	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Benzo[g,h,i]perylene	**0.0046**	**J H**	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Benzo[k]fluoranthene	ND	H	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Bis(2-chloroethoxy)methane	ND	H	0.042	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Bis(2-chloroethyl)ether	ND	H	0.058	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Bis(2-ethylhexyl) phthalate	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Butylbenzylphthalate	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Caprolactam	ND	H	0.19	0.038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Carbazole	ND	H	0.042	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Chrysene	**0.0047**	**J H**	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Di-n-butyl phthalate	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Di-n-octyl phthalate	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Dibenz(a,h)anthracene	ND	H	0.019	0.0077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Dibenzofuran	ND	H	0.042	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Diethyl phthalate	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Dimethyl phthalate	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Fluoranthene	**0.0056**	**J H**	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
4-Chloroaniline	ND	H	0.19	0.038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Fluorene	ND	H	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
4-Chlorophenyl-phenyl ether	ND	H	0.050	0.023	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Hexachlorobenzene	ND	H	0.019	0.0077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Hexachlorobutadiene	ND	H	0.088	0.042	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Hexachlorocyclopentadiene	ND	H	0.58	0.23	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Hexachloroethane	ND	H	0.19	0.038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Indeno[1,2,3-cd]pyrene	ND	H	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Isophorone	ND	H	0.042	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
N-Nitrosodi-n-propylamine	ND	H	0.058	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
N-Nitrosodiphenylamine	ND	H	0.042	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Naphthalene	ND	H	0.019	0.0077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1

Client Sample ID: B55-PDI-SB-21 (4.5-5.5)
Lab Sample ID: 410-21255-7
Date Collected: 11/17/20 14:15
Matrix: Soil
Date Received: 11/18/20 11:46
Percent Solids: 85.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrobenzene	ND	H	0.077	0.031	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Phenanthrene	ND	H	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Aniline	ND	H	0.58	0.19	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Phenol	ND	H	0.042	0.019	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Pyrene	**0.0087**	**J H**	0.019	0.0038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Pentachlorophenol	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Benzyl alcohol	ND	H	0.58	0.19	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Dicyclohexylamine	ND	~~H~~ J	2.3	0.77	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
n,n'-Dimethylaniline	ND	~~H~~ J	0.19	0.038	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Pyridine	ND	H	0.19	0.077	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1
Triethylamine	ND	H ~~*1~~ J	5.8	1.9	mg/Kg	☼	12/03/20 16:08	12/04/20 16:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*100*		*45 - 108*	*12/03/20 16:08*	*12/04/20 16:26*	*1*
Nitrobenzene-d5 (Surr)	*68*		*32 - 97*	*12/03/20 16:08*	*12/04/20 16:26*	*1*
2-Fluorophenol (Surr)	*83*		*26 - 96*	*12/03/20 16:08*	*12/04/20 16:26*	*1*
2-Fluorobiphenyl (Surr)	*84*		*39 - 100*	*12/03/20 16:08*	*12/04/20 16:26*	*1*
2,4,6-Tribromophenol (Surr)	*72*		*13 - 121*	*12/03/20 16:08*	*12/04/20 16:26*	*1*
Phenol-d5 (Surr)	*85*		*27 - 104*	*12/03/20 16:08*	*12/04/20 16:26*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.058	0.029	mg/Kg	☼	11/29/20 10:15	12/03/20 12:34	1
Formaldehyde	**0.18**		0.087	0.029	mg/Kg	☼	11/29/20 10:15	12/03/20 12:34	1
Glutaraldehyde	ND		0.058	0.029	mg/Kg	☼	11/29/20 10:15	12/03/20 12:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*94*		*77 - 133*	*11/29/20 10:15*	*12/03/20 12:34*	*1*

Client Sample ID: B55-PDI-SB-17 (8-9)
Lab Sample ID: 410-21255-8
Date Collected: 11/17/20 14:30
Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment
Matrix: Soil
Date Received: 11/18/20 11:46

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**17.2**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-17 (8-9)
Lab Sample ID: 410-21255-8
Date Collected: 11/17/20 14:30
Date Collected is 11/16/20
Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Date Received: 11/18/20 11:46
Percent Solids: 82.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
trans-1,3-Dichloropropene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Ethylbenzene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Styrene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,4-Dichlorobenzene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2-Dibromoethane	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2-Dichloroethane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
4-Methyl-2-pentanone	ND		0.58	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50

Client Sample ID: B55-PDI-SB-17 (8-9)
Lab Sample ID: 410-21255-8

Date Collected: 11/17/20 14:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 82.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Toluene	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Chlorobenzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2,4-Trimethylbenzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Cyclohexane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2,4-Trichlorobenzene	ND		0.58	0.29	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,4-Dioxane	ND		15	2.2	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Dibromochloromethane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Tetrachloroethene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
cis-1,2-Dichloroethene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
trans-1,2-Dichloroethene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Methyl tertiary butyl ether	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
m&p-Xylene	ND		0.29	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,3,5-Trimethylbenzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,3-Dichlorobenzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Carbon tetrachloride	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
2-Hexanone	ND		0.58	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Acetone	ND		1.2	0.35	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Chloroform	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Benzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,1,1-Trichloroethane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Bromomethane	ND		0.29	0.041	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Chloromethane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Bromochloromethane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Chloroethane	ND		0.29	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Vinyl chloride	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Methylene Chloride	ND		0.29	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Carbon disulfide	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Bromoform	ND	*	0.58	0.29	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Bromodichloromethane	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,1-Dichloroethane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,1-Dichloroethene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Trichlorofluoromethane	ND		0.29	0.041	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Dichlorodifluoromethane	ND		0.29	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Freon 113	ND		0.58	0.035	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2-Dichloropropane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
2-Butanone	ND		0.58	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,1,2-Trichloroethane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
2-Nitropropane	~~ND~~	~~*~~ R	~~0.58~~	~~0.12~~	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Trichloroethene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Methyl acetate	ND		0.29	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,1,2,2-Tetrachloroethane	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2,3-Trichlorobenzene	ND		0.58	0.29	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
o-Xylene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2-Dichlorobenzene	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
1,2-Dibromo-3-Chloropropane	ND		0.29	0.029	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Acetonitrile	ND		5.8	1.5	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Isopropylbenzene	ND		0.29	0.023	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Chlorodifluoromethane	ND		0.58	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50

Client Sample ID: B55-PDI-SB-17 (8-9)
Lab Sample ID: 410-21255-8

Date Collected: 11/17/20 14:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 82.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyclohexanone	ND		15	1.5	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Ethyl acetate	ND		0.29	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Ethyl ether	ND		0.29	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Isobutyl alcohol	ND		15	2.2	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Naphthalene	ND		0.29	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
n-Butanol	ND		15	3.3	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
n-Butylbenzene	ND		0.47	0.18	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
n-Heptane	ND		0.47	0.18	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
p-Isopropyltoluene	ND		0.29	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
sec-Butylbenzene	ND		0.29	0.12	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
t-Butyl alcohol	ND		5.8	0.88	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
tert-Butylbenzene	ND		0.29	0.047	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Tetrahydrofuran	ND		0.47	0.058	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50
Xylenes, Total	ND		0.58	0.082	mg/Kg	☼	11/19/20 20:14	11/25/20 01:24	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Hexane, 2,5-dimethyl-	*2.6*	*T J N*	*mg/Kg*	☼	*8.67*	*592-13-2*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
Cyclopentane, 1,2,4-trimethyl-, (1.alpha.,2.beta.,4.alpha.)-	*1.6*	*T J N*	*mg/Kg*	☼	*9.02*	*16883-48-0*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*1.6*	*T J N*	*mg/Kg*	☼	*12.09*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*2.6*	*T J N*	*mg/Kg*	☼	*12.22*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
2H-Quinolizin-2-ol, octahydro-, trans-	*1.5*	*T J N*	*mg/Kg*	☼	*12.62*	*31172-60-8*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*2.2*	*T J N*	*mg/Kg*	☼	*12.97*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*1.9*	*T J N*	*mg/Kg*	☼	*13.11*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*1.7*	*T J N*	*mg/Kg*	☼	*13.25*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
Unknown	*1.6*	*T J N*	*mg/Kg*	☼	*14.12*		*11/19/20 20:14*	*11/25/20 01:24*	*50*
Benzene, 1-methyl-4-(1-methylpropyl)-	*2.3*	*T J N*	*mg/Kg*	☼	*14.33*	*1595-16-0*	*11/19/20 20:14*	*11/25/20 01:24*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*54 - 135*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
4-Bromofluorobenzene (Surr)	*89*		*50 - 131*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
Dibromofluoromethane (Surr)	*77*		*50 - 141*	*11/19/20 20:14*	*11/25/20 01:24*	*50*
Toluene-d8 (Surr)	*79*		*52 - 141*	*11/19/20 20:14*	*11/25/20 01:24*	*50*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
1,2,4,5-Tetrachlorobenzene	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,2'-oxybis[1-chloropropane]	ND		0.052	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4,5-Trichlorophenol	ND		0.081	0.036	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4,6-Trichlorophenol	ND		0.068	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4-Dichlorophenol	ND		0.052	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4-Dimethylphenol	ND		0.081	0.036	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4-Dinitrophenol	ND		1.2	0.40	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,4-Dinitrotoluene	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2,6-Dinitrotoluene	ND		0.060	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Chloronaphthalene	ND		0.040	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Chlorophenol	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1

Client Sample ID: B55-PDI-SB-17 (8-9)
Lab Sample ID: 410-21255-8

Date Collected: 11/17/20 14:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 82.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	ND		0.040	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Methylphenol	ND		0.081	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Nitroaniline	ND		0.060	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
2-Nitrophenol	ND		0.068	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
3,3'-Dichlorobenzidine	ND		0.40	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
3-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4,6-Dinitro-2-methylphenol	ND		0.60	0.28	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Bromophenyl-phenylether	ND		0.060	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Chloro-3-methylphenol	ND		0.060	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Methylphenol, 3 & 4	ND		0.060	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Nitrophenol	ND		0.60	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Acenaphthene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Acenaphthylene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Acetophenone	ND		0.060	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Anthracene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Atrazine	ND		0.52	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzaldehyde	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzo[a]anthracene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzo[a]pyrene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzo[b]fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzo[g,h,i]perylene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzo[k]fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Bis(2-chloroethoxy)methane	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Bis(2-chloroethyl)ether	ND		0.060	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Butylbenzylphthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Caprolactam	ND		0.20	0.040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Carbazole	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Chrysene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Di-n-butyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Di-n-octyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Dibenz(a,h)anthracene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Dibenzofuran	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Diethyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Dimethyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Fluoranthene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Chloroaniline	ND		0.20	0.040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Fluorene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
4-Chlorophenyl-phenyl ether	ND		0.052	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Hexachlorobenzene	ND		0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Hexachlorobutadiene	ND		0.093	0.044	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Hexachlorocyclopentadiene	ND		0.60	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Hexachloroethane	ND		0.20	0.040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Isophorone	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
N-Nitrosodi-n-propylamine	ND		0.060	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
N-Nitrosodiphenylamine	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Naphthalene	**0.010**	**J**	0.020	0.0081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1

Client Sample ID: B55-PDI-SB-17 (8-9)
Lab Sample ID: 410-21255-8

Date Collected: 11/17/20 14:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 82.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrobenzene	ND		0.081	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Phenanthrene	ND		0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Aniline	ND		0.60	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Phenol	ND		0.044	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Pyrene	**0.0054**	**J**	0.020	0.0040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Pentachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Benzyl alcohol	ND		0.60	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
n,n'-Dimethylaniline	ND		0.20	0.040	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Pyridine	ND		0.20	0.081	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
Triethylamine	ND	*- *1	6.0	2.0	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1
1,4-Dioxane	ND		0.40	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 00:01	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
~~*Unknown*~~	*1.2*	*T J B* R	*mg/Kg*	☼	*3.89*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.34*	*T J* N	*mg/Kg*	☼	*4.80*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.30*	*T J* N	*mg/Kg*	☼	*4.84*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.38*	*T J* N	*mg/Kg*	☼	*5.06*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.35*	*T J* N	*mg/Kg*	☼	*5.67*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.38*	*T J* N	*mg/Kg*	☼	*5.70*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Cyclopentane, hexyl-	*0.34*	*T J N*	*mg/Kg*	☼	*5.77*	*4457-00-5*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.43*	*T J* N	*mg/Kg*	☼	*5.96*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.41*	*T J* N	*mg/Kg*	☼	*6.31*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.30*	*T J* N	*mg/Kg*	☼	*6.37*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.42*	*T J* N	*mg/Kg*	☼	*6.50*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Benzene, pentamethyl-	*0.42*	*T J N*	*mg/Kg*	☼	*6.80*	*700-12-9*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.39*	*T J* N	*mg/Kg*	☼	*6.96*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.34*	*T J* N	*mg/Kg*	☼	*7.00*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.41*	*T J* N	*mg/Kg*	☼	*7.03*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.42*	*T J* N	*mg/Kg*	☼	*7.09*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.41*	*T J* N	*mg/Kg*	☼	*7.22*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Tetradecane	*0.35*	*T J N*	*mg/Kg*	☼	*7.47*	*629-59-4*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*1.1*	*T J* N	*mg/Kg*	☼	*8.23*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.30*	*T J* N	*mg/Kg*	☼	*8.32*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.71*	*T J N*	*mg/Kg*	☼	*8.61*	*7560-83-0*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.33*	*T J* N	*mg/Kg*	☼	*8.79*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.40*	*T J* N	*mg/Kg*	☼	*9.75*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Unknown	*0.37*	*T J* N	*mg/Kg*	☼	*10.07*		*11/24/20 16:27*	*11/26/20 00:01*	*1*
Cyclic octaatomic sulfur	*0.44*	*T J N*	*mg/Kg*	☼	*11.15*	*10544-50-0*	*11/24/20 16:27*	*11/26/20 00:01*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*107*		*45 - 108*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Nitrobenzene-d5 (Surr)	*75*		*32 - 97*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
2-Fluorophenol (Surr)	*86*		*26 - 96*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
2-Fluorobiphenyl (Surr)	*85*		*39 - 100*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
2,4,6-Tribromophenol (Surr)	*85*		*13 - 121*	*11/24/20 16:27*	*11/26/20 00:01*	*1*
Phenol-d5 (Surr)	*91*		*27 - 104*	*11/24/20 16:27*	*11/26/20 00:01*	*1*

Client Sample ID: B55-PDI-SB-17 (8-9)
Lab Sample ID: 410-21255-8

Date Collected: 11/17/20 14:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 82.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
~~Dicyclohexylamine~~	8.6		7.2	2.4	mg/Kg	☼	11/24/20 16:27	12/02/20 16:56	3

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*91*		*45 - 108*	*11/24/20 16:27*	*12/02/20 16:56*	*3*
Nitrobenzene-d5 (Surr)	*65*		*32 - 97*	*11/24/20 16:27*	*12/02/20 16:56*	*3*
2-Fluorophenol (Surr)	*64*		*26 - 96*	*11/24/20 16:27*	*12/02/20 16:56*	*3*
2-Fluorobiphenyl (Surr)	*76*		*39 - 100*	*11/24/20 16:27*	*12/02/20 16:56*	*3*
2,4,6-Tribromophenol (Surr)	*66*		*13 - 121*	*11/24/20 16:27*	*12/02/20 16:56*	*3*
Phenol-d5 (Surr)	*66*		*27 - 104*	*11/24/20 16:27*	*12/02/20 16:56*	*3*

Compounds Dicyclohexylamine, n,n'-Dimethylamine and Triethylamine are reported from the "RE" analysis.

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND	H	0.044	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
1,2,4,5-Tetrachlorobenzene	ND	H	0.044	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2,2'-oxybis[1-chloropropane]	ND	H	0.052	0.024	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2,3,4,6-Tetrachlorophenol	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2,4,5-Trichlorophenol	ND	H	0.080	0.036	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2,4,6-Trichlorophenol	ND	H	0.068	0.032	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2,4-Dichlorophenol	ND	H	0.052	0.024	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2,4-Dimethylphenol	ND	H	0.080	0.036	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2,4-Dinitrophenol	ND	H	1.2	0.40	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2,4-Dinitrotoluene	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2,6-Dinitrotoluene	ND	H	0.060	0.028	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2-Chloronaphthalene	ND	H	0.040	0.0080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2-Chlorophenol	ND	H	0.044	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2-Methylnaphthalene	**0.0052**	**J H**	0.040	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2-Methylphenol	ND	H	0.080	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2-Nitroaniline	ND	H	0.060	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
2-Nitrophenol	ND	H	0.068	0.032	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
3,3'-Dichlorobenzidine	ND	H	0.40	0.12	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
3-Nitroaniline	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
4,6-Dinitro-2-methylphenol	ND	H	0.60	0.28	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
4-Bromophenyl-phenylether	ND	H	0.060	0.028	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
4-Chloro-3-methylphenol	ND	H	0.060	0.028	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Methylphenol, 3 & 4	ND	H	0.060	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
4-Nitroaniline	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
4-Nitrophenol	ND	H	0.60	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Acenaphthene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Acenaphthylene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Acetophenone	ND	H	0.060	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Anthracene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Atrazine	ND	H	0.52	0.24	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Benzaldehyde	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Benzo[a]anthracene	ND	H	0.020	0.0080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Benzo[a]pyrene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Benzo[b]fluoranthene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Benzo[g,h,i]perylene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Benzo[k]fluoranthene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Bis(2-chloroethoxy)methane	ND	H	0.044	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Bis(2-chloroethyl)ether	ND	H	0.060	0.028	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1

Client Sample ID: B55-PDI-SB-17 (8-9)
Lab Sample ID: 410-21255-8

Date Collected: 11/17/20 14:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 82.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Butylbenzylphthalate	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Caprolactam	ND	H	0.20	0.040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Carbazole	ND	H	0.044	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Chrysene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Di-n-butyl phthalate	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Di-n-octyl phthalate	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Dibenz(a,h)anthracene	ND	H	0.020	0.0080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Dibenzofuran	ND	H	0.044	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Diethyl phthalate	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Dimethyl phthalate	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Fluoranthene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
4-Chloroaniline	ND	H	0.20	0.040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Fluorene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
4-Chlorophenyl-phenyl ether	ND	H	0.052	0.024	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Hexachlorobenzene	ND	H	0.020	0.0080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Hexachlorobutadiene	ND	H	0.092	0.044	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Hexachlorocyclopentadiene	ND	H	0.60	0.24	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Hexachloroethane	ND	H	0.20	0.040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Indeno[1,2,3-cd]pyrene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Isophorone	ND	H	0.044	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
N-Nitrosodi-n-propylamine	ND	H	0.060	0.028	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
N-Nitrosodiphenylamine	ND	H	0.044	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Naphthalene	ND	H	0.020	0.0080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Nitrobenzene	ND	H	0.080	0.032	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Phenanthrene	ND	H	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Aniline	ND	H	0.60	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Phenol	ND	H	0.044	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Pyrene	**0.0043**	**J H**	0.020	0.0040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Pentachlorophenol	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Benzyl alcohol	ND	H	0.60	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Dicyclohexylamine	**15**	**H E J**	2.4	0.80	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
n,n'-Dimethylaniline	ND	H J	0.20	0.040	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Pyridine	ND	H	0.20	0.080	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1
Triethylamine	ND	H J	6.0	2.0	mg/Kg	☼	12/03/20 16:08	12/04/20 16:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*101*		*45 - 108*	*12/03/20 16:08*	*12/04/20 16:50*	*1*
Nitrobenzene-d5 (Surr)	*70*		*32 - 97*	*12/03/20 16:08*	*12/04/20 16:50*	*1*
2-Fluorophenol (Surr)	*76*		*26 - 96*	*12/03/20 16:08*	*12/04/20 16:50*	*1*
2-Fluorobiphenyl (Surr)	*78*		*39 - 100*	*12/03/20 16:08*	*12/04/20 16:50*	*1*
2,4,6-Tribromophenol (Surr)	*66*		*13 - 121*	*12/03/20 16:08*	*12/04/20 16:50*	*1*
Phenol-d5 (Surr)	*79*		*27 - 104*	*12/03/20 16:08*	*12/04/20 16:50*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	H * J	0.060	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:16	1
Formaldehyde	**0.22**	**H J**	0.091	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:16	1
Glutaraldehyde	ND	H J	0.060	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:16	1

Client Sample ID: B55-PDI-SB-17 (8-9)
Lab Sample ID: 410-21255-8

Date Collected: 11/17/20 14:30 Date Collected is 11/16/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 82.8

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*107*		*77 - 133*	*11/20/20 13:08*	*11/24/20 00:16*	*1*

Client Sample ID: B55-PDI-SB-06 (12-13)
Lab Sample ID: 410-21255-9

Date Collected: 11/17/20 14:45 Date Collected is 11/11/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment Date

Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**16.1**		1.0	1.0	%			11/18/20 23:40	1

Client Sample ID: B55-PDI-SB-06 (12-13)
Lab Sample ID: 410-21255-9

Date Collected: 11/17/20 14:45 Date Collected is 11/11/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 83.9

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,1,2,2-Tetrachloroethane	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,1,2-Trichloroethane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,1-Dichloroethane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,1-Dichloroethene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2,3-Trichlorobenzene	ND		0.0084	0.0042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2,4-Trichlorobenzene	ND		0.0084	0.0042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2,4-Trimethylbenzene	**0.00079**	**J**	0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2-Dibromo-3-Chloropropane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2-Dibromoethane	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2-Dichlorobenzene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2-Dichloroethane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,2-Dichloropropane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,3,5-Trimethylbenzene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,3-Dichlorobenzene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,4-Dichlorobenzene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
1,4-Dioxane	ND		0.21	0.031	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
2-Butanone	ND		0.0084	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
2-Hexanone	ND		0.0084	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
2-Nitropropane	ND		0.0084	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
4-Methyl-2-pentanone	ND		0.0084	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Acetone	**0.049**		0.017	0.0050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Acetonitrile	ND		0.084	0.021	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Benzene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Bromochloromethane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Bromodichloromethane	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Bromoform	ND		0.0084	0.0042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Bromomethane	ND		0.0042	0.00059	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Carbon disulfide	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Carbon tetrachloride	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Chlorobenzene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Chlorodifluoromethane	ND		0.0084	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Chloroethane	ND		0.0042	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Chloroform	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Chloromethane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1

Client Sample ID: B55-PDI-SB-06 (12-13)
Lab Sample ID: 410-21255-9
Date Collected: 11/17/20 14:45 Date Collected is 11/11/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment
Matrix: Soil
Percent Solids: 83.9

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
cis-1,3-Dichloropropene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Cyclohexane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Cyclohexanone	**0.026**	**J**	0.21	0.021	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Dibromochloromethane	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Dichlorodifluoromethane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Ethyl acetate	ND		0.0042	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Ethyl ether	ND		0.0042	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Ethylbenzene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Freon 113	ND		0.0084	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Isobutyl alcohol	ND		0.21	0.032	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Isopropylbenzene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
m&p-Xylene	ND		0.0042	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Methyl acetate	ND		0.0042	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Methyl tertiary butyl ether	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Methylcyclohexane	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Methylene Chloride	ND		0.0042	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Naphthalene	ND		0.0042	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
n-Butanol	ND		0.21	0.047	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
n-Butylbenzene	ND		0.0067	0.0025	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
n-Heptane	ND		0.0067	0.0025	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
o-Xylene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
p-Isopropyltoluene	ND		0.0042	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
sec-Butylbenzene	ND		0.0042	0.0017	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Styrene	ND		0.0042	0.00034	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
t-Butyl alcohol	ND		0.084	0.013	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
tert-Butylbenzene	ND		0.0042	0.00067	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Tetrachloroethene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Tetrahydrofuran	ND		0.0067	0.00084	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Toluene	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
trans-1,2-Dichloroethene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
trans-1,3-Dichloropropene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Trichloroethene	ND		0.0042	0.00042	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Trichlorofluoromethane	ND		0.0042	0.00059	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Vinyl chloride	ND		0.0042	0.00050	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1
Xylenes, Total	ND		0.0084	0.0012	mg/Kg	☼	11/18/20 22:22	11/24/20 17:47	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*mg/Kg*	☼			*11/18/20 22:22*	*11/24/20 17:47*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/18/20 22:22*	*11/24/20 17:47*	*1*
4-Bromofluorobenzene (Surr)	*97*		*50 - 131*	*11/18/20 22:22*	*11/24/20 17:47*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/18/20 22:22*	*11/24/20 17:47*	*1*
Toluene-d8 (Surr)	*101*		*52 - 141*	*11/18/20 22:22*	*11/24/20 17:47*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
1,2,4,5-Tetrachlorobenzene	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1

Client Sample ID: B55-PDI-SB-06 (12-13)
Lab Sample ID: 410-21255-9

Date Collected: 11/17/20 14:45 Date Collected is 11/11/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 83.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,2'-oxybis[1-chloropropane]	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4,5-Trichlorophenol	ND		0.079	0.036	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4,6-Trichlorophenol	ND		0.067	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4-Dichlorophenol	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4-Dimethylphenol	ND		0.079	0.036	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4-Dinitrophenol	ND		1.2	0.39	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,4-Dinitrotoluene	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2,6-Dinitrotoluene	ND		0.059	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Chloronaphthalene	ND		0.039	0.0079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Chlorophenol	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Methylnaphthalene	ND		0.039	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Methylphenol	ND		0.079	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Nitroaniline	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
2-Nitrophenol	ND		0.067	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
3,3'-Dichlorobenzidine	ND		0.39	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
3-Nitroaniline	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4,6-Dinitro-2-methylphenol	ND		0.59	0.28	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Bromophenyl-phenylether	ND		0.059	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Chloro-3-methylphenol	ND		0.059	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Methylphenol, 3 & 4	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Nitroaniline	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Nitrophenol	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Acenaphthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Acenaphthylene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Acetophenone	ND		0.059	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Anthracene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Atrazine	ND		0.51	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzaldehyde	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzo[a]anthracene	ND		0.020	0.0079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzo[a]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzo[b]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzo[g,h,i]perylene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzo[k]fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Bis(2-chloroethoxy)methane	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Bis(2-chloroethyl)ether	ND		0.059	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Butylbenzylphthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Caprolactam	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Carbazole	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Chrysene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Di-n-butyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Di-n-octyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Dibenz(a,h)anthracene	ND		0.020	0.0079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Dibenzofuran	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Diethyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Dimethyl phthalate	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Fluoranthene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Chloroaniline	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1

Client Sample ID: B55-PDI-SB-06 (12-13)
Lab Sample ID: 410-21255-9
Date Collected: 11/17/20 14:45
Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment
Matrix: Soil
Date Received: 11/18/20 11:46
Percent Solids: 83.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluorene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
4-Chlorophenyl-phenyl ether	ND		0.051	0.024	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Hexachlorobenzene	ND		0.020	0.0079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Hexachlorobutadiene	ND		0.091	0.043	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Hexachlorocyclopentadiene	ND		0.59	0.24	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Hexachloroethane	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Isophorone	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
N-Nitrosodi-n-propylamine	ND		0.059	0.028	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
N-Nitrosodiphenylamine	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Naphthalene	ND		0.020	0.0079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Nitrobenzene	ND		0.079	0.032	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Phenanthrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Aniline	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Phenol	ND		0.043	0.020	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Pyrene	ND		0.020	0.0039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Pentachlorophenol	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Benzyl alcohol	ND		0.59	0.20	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
n,n'-Dimethylaniline	ND		0.20	0.039	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Pyridine	ND		0.20	0.079	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
Triethylamine	ND	*- *1	5.9	2.0	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1
1,4-Dioxane	ND		0.39	0.12	mg/Kg	☼	11/24/20 16:27	11/26/20 12:53	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.7*	*T J N*	*mg/Kg*	☼	*3.21*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*4.2*	*T J B N*	*mg/Kg*	☼	*3.87*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
2-Cyclohexen-1-one	*0.37*	*T J N*	*mg/Kg*	☼	*4.78*	*930-68-7*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.51*	*T J N*	*mg/Kg*	☼	*4.99*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
1,2,4-Trithiolane	*0.45*	*T J N*	*mg/Kg*	☼	*6.17*	*289-16-7*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.40*	*T J N*	*mg/Kg*	☼	*6.99*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Cyclohexane, isothiocyanato-	*0.21*	*T J N*	*mg/Kg*	☼	*7.04*	*1122-82-3*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.47*	*T J N*	*mg/Kg*	☼	*7.07*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.19*	*T J N*	*mg/Kg*	☼	*7.17*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.18*	*T J N*	*mg/Kg*	☼	*7.83*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*1.4*	*T J N*	*mg/Kg*	☼	*8.20*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*1.2*	*T J N*	*mg/Kg*	☼	*8.25*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*2.0*	*T J N*	*mg/Kg*	☼	*8.38*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.53*	*T J N*	*mg/Kg*	☼	*8.48*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.59*	*T J N*	*mg/Kg*	☼	*8.50*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.76*	*T J N*	*mg/Kg*	☼	*8.53*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.47*	*T J N*	*mg/Kg*	☼	*8.55*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*4.1*	*T J N*	*mg/Kg*	☼	*8.59*	*7560-83-0*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.34*	*T J N*	*mg/Kg*	☼	*8.73*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.27*	*T J N*	*mg/Kg*	☼	*8.77*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.40*	*T J N*	*mg/Kg*	☼	*8.85*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Lenthionine	*2.1*	*T J N*	*mg/Kg*	☼	*9.31*	*292-46-6*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.24*	*T J N*	*mg/Kg*	☼	*9.35*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*1.2*	*T J N*	*mg/Kg*	☼	*9.73*		*11/24/20 16:27*	*11/26/20 12:53*	*1*
Unknown	*0.45*	*T J N*	*mg/Kg*	☼	*10.05*		*11/24/20 16:27*	*11/26/20 12:53*	*1*

Client Sample ID: B55-PDI-SB-06 (12-13)
Lab Sample ID: 410-21255-9

Date Collected: 11/17/20 14:45 Date Collected is 11/11/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 83.9

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	*100*		*45 - 108*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
Nitrobenzene-d5 (Surr)	*69*		*32 - 97*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
2-Fluorophenol (Surr)	*82*		*26 - 96*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
2-Fluorobiphenyl (Surr)	*82*		*39 - 100*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
2,4,6-Tribromophenol (Surr)	*70*		*13 - 121*	*11/24/20 16:27*	*11/26/20 12:53*	*1*
Phenol-d5 (Surr)	*85*		*27 - 104*	*11/24/20 16:27*	*11/26/20 12:53*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
~~Dicyclohexylamine~~	13		12	3.9	mg/Kg	☼	11/24/20 16:27	11/26/20 13:18	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	*77*		*45 - 108*	*11/24/20 16:27*	*11/26/20 13:18*	*5*
Nitrobenzene-d5 (Surr)	*59*		*32 - 97*	*11/24/20 16:27*	*11/26/20 13:18*	*5*
2-Fluorophenol (Surr)	*67*		*26 - 96*	*11/24/20 16:27*	*11/26/20 13:18*	*5*
2-Fluorobiphenyl (Surr)	*69*		*39 - 100*	*11/24/20 16:27*	*11/26/20 13:18*	*5*
2,4,6-Tribromophenol (Surr)	*53*		*13 - 121*	*11/24/20 16:27*	*11/26/20 13:18*	*5*
Phenol-d5 (Surr)	*68*		*27 - 104*	*11/24/20 16:27*	*11/26/20 13:18*	*5*

Compounds Dicyclohexylamine, n,n'-Dimethylamine and Triethylamine are reported from the "RE" analysis.

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND	H	0.043	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
1,2,4,5-Tetrachlorobenzene	ND	H	0.043	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2,2'-oxybis[1-chloropropane]	ND	H	0.051	0.023	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2,3,4,6-Tetrachlorophenol	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2,4,5-Trichlorophenol	ND	H	0.078	0.035	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2,4,6-Trichlorophenol	ND	H	0.066	0.031	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2,4-Dichlorophenol	ND	H	0.051	0.023	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2,4-Dimethylphenol	ND	H	0.078	0.035	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2,4-Dinitrophenol	ND	H	1.2	0.39	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2,4-Dinitrotoluene	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2,6-Dinitrotoluene	ND	H	0.059	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2-Chloronaphthalene	ND	H	0.039	0.0078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2-Chlorophenol	ND	H	0.043	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2-Methylnaphthalene	ND	H	0.039	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2-Methylphenol	ND	H	0.078	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2-Nitroaniline	ND	H	0.059	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
2-Nitrophenol	ND	H	0.066	0.031	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
3,3'-Dichlorobenzidine	ND	H	0.39	0.12	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
3-Nitroaniline	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
4,6-Dinitro-2-methylphenol	ND	H	0.59	0.27	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
4-Bromophenyl-phenylether	ND	H	0.059	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
4-Chloro-3-methylphenol	ND	H	0.059	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Methylphenol, 3 & 4	ND	H	0.059	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
4-Nitroaniline	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
4-Nitrophenol	ND	H	0.59	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Acenaphthene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Acenaphthylene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Acetophenone	ND	H	0.059	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Anthracene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Atrazine	ND	H	0.51	0.23	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1

Client Sample ID: B55-PDI-SB-06 (12-13) — **Lab Sample ID: 410-21255-9**

Date Collected: 11/17/20 14:45 — **Matrix: Soil**

Date Received: 11/18/20 11:46 — **Percent Solids: 83.9**

Date Collected is 11/11/20
Date Recorded Here is the Sample Shipment

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzaldehyde	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Benzo[a]anthracene	ND	H	0.020	0.0078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Benzo[a]pyrene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Benzo[b]fluoranthene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Benzo[g,h,i]perylene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Benzo[k]fluoranthene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Bis(2-chloroethoxy)methane	ND	H	0.043	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Bis(2-chloroethyl)ether	ND	H	0.059	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Bis(2-ethylhexyl) phthalate	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Butylbenzylphthalate	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Caprolactam	ND	H	0.20	0.039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Carbazole	ND	H	0.043	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Chrysene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Di-n-butyl phthalate	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Di-n-octyl phthalate	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Dibenz(a,h)anthracene	ND	H	0.020	0.0078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Dibenzofuran	ND	H	0.043	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Diethyl phthalate	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Dimethyl phthalate	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Fluoranthene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
4-Chloroaniline	ND	H	0.20	0.039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Fluorene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
4-Chlorophenyl-phenyl ether	ND	H	0.051	0.023	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Hexachlorobenzene	ND	H	0.020	0.0078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Hexachlorobutadiene	ND	H	0.090	0.043	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Hexachlorocyclopentadiene	ND	H	0.59	0.23	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Hexachloroethane	ND	H	0.20	0.039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Indeno[1,2,3-cd]pyrene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Isophorone	ND	H	0.043	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
N-Nitrosodi-n-propylamine	ND	H	0.059	0.027	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
N-Nitrosodiphenylamine	ND	H	0.043	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Naphthalene	ND	H	0.020	0.0078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Nitrobenzene	ND	H	0.078	0.031	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Phenanthrene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Aniline	ND	H	0.59	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Phenol	ND	H	0.043	0.020	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Pyrene	ND	H	0.020	0.0039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Pentachlorophenol	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Benzyl alcohol	ND	H	0.59	0.20	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Dicyclohexylamine	**16**	~~H~~ **E** J	2.3	0.78	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
n,n'-Dimethylaniline	ND	~~H~~ J	0.20	0.039	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Pyridine	ND	H	0.20	0.078	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1
Triethylamine	ND	~~H * *1~~ J	5.9	2.0	mg/Kg	☼	12/03/20 16:08	12/04/20 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*95*		*45 - 108*	*12/03/20 16:08*	*12/04/20 17:14*	*1*
Nitrobenzene-d5 (Surr)	*65*		*32 - 97*	*12/03/20 16:08*	*12/04/20 17:14*	*1*
2-Fluorophenol (Surr)	*80*		*26 - 96*	*12/03/20 16:08*	*12/04/20 17:14*	*1*
2-Fluorobiphenyl (Surr)	*79*		*39 - 100*	*12/03/20 16:08*	*12/04/20 17:14*	*1*
2,4,6-Tribromophenol (Surr)	*61*		*13 - 121*	*12/03/20 16:08*	*12/04/20 17:14*	*1*

Client Sample ID: B55-PDI-SB-06 (12-13)
Lab Sample ID: 410-21255-9

Date Collected: 11/17/20 14:45 Date Collected is 11/11/20
Date Received: 11/18/20 11:46 Date Recorded Here is the Sample Shipment

Matrix: Soil
Percent Solids: 83.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Phenol-d5 (Surr)	*83*		*27 - 104*	*12/03/20 16:08*	*12/04/20 17:14*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND	H J	0.060	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:27	1
Formaldehyde	**0.12**	H J	0.089	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:27	1
Glutaraldehyde	ND	H J	0.060	0.030	mg/Kg	☼	11/20/20 13:08	11/24/20 00:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	*101*		*77 - 133*	*11/20/20 13:08*	*11/24/20 00:27*	*1*

Client Sample ID: TB20083
Lab Sample ID: 410-21255-10

Date Collected: 11/17/20 00:00
Date Received: 11/18/20 11:46

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			11/28/20 14:11	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			11/28/20 14:11	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			11/28/20 14:11	1
1,2,4-Trimethylbenzene	ND		5.0	1.0	ug/L			11/28/20 14:11	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			11/28/20 14:11	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			11/28/20 14:11	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
1,3,5-Trimethylbenzene	ND		5.0	0.30	ug/L			11/28/20 14:11	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
1,4-Dioxane	ND		250	29	ug/L			11/28/20 14:11	1
2-Butanone	ND		10	0.30	ug/L			11/28/20 14:11	1
2-Hexanone	ND		10	0.30	ug/L			11/28/20 14:11	1
2-Nitropropane	ND		10	0.80	ug/L			11/28/20 14:11	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			11/28/20 14:11	1
Acetone	ND		20	0.70	ug/L			11/28/20 14:11	1
Acetonitrile	ND		100	16	ug/L			11/28/20 14:11	1
Benzene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Bromochloromethane	ND		5.0	0.20	ug/L			11/28/20 14:11	1
Bromodichloromethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Bromoform	ND		4.0	1.0	ug/L			11/28/20 14:11	1
Bromomethane	ND		1.0	0.30	ug/L			11/28/20 14:11	1
Carbon disulfide	ND		5.0	0.20	ug/L			11/28/20 14:11	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Chlorobenzene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			11/28/20 14:11	1
Chloroethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1

Client Sample ID: TB20083

Date Collected: 11/17/20 00:00
Date Received: 11/18/20 11:46

Lab Sample ID: 410-21255-10

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroform	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Chloromethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Cyclohexane	ND		5.0	1.0	ug/L			11/28/20 14:11	1
Cyclohexanone	ND		100	25	ug/L			11/28/20 14:11	1
Dibromochloromethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Ethyl acetate	ND		5.0	0.70	ug/L			11/28/20 14:11	1
Ethyl ether	ND		5.0	0.20	ug/L			11/28/20 14:11	1
Ethylbenzene	ND		1.0	0.40	ug/L			11/28/20 14:11	1
Freon 113	ND		10	0.20	ug/L			11/28/20 14:11	1
Isobutyl alcohol	ND		250	36	ug/L			11/28/20 14:11	1
Isopropylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
m&p-Xylene	ND		5.0	1.0	ug/L			11/28/20 14:11	1
Methyl acetate	ND		5.0	0.30	ug/L			11/28/20 14:11	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Methylcyclohexane	ND		5.0	0.50	ug/L			11/28/20 14:11	1
Methylene Chloride	ND		1.0	0.30	ug/L			11/28/20 14:11	1
Naphthalene	ND		5.0	1.0	ug/L			11/28/20 14:11	1
n-Butanol	ND		250	61	ug/L			11/28/20 14:11	1
n-Butylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
n-Heptane	ND		5.0	2.0	ug/L			11/28/20 14:11	1
o-Xylene	ND		1.0	0.40	ug/L			11/28/20 14:11	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
Styrene	ND		5.0	0.20	ug/L			11/28/20 14:11	1
t-Butyl alcohol	ND		50	12	ug/L			11/28/20 14:11	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			11/28/20 14:11	1
Tetrachloroethene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Tetrahydrofuran	ND		10	0.70	ug/L			11/28/20 14:11	1
Toluene	**0.31**	**J**	1.0	0.20	ug/L			11/28/20 14:11	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Trichloroethene	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Vinyl chloride	ND		1.0	0.20	ug/L			11/28/20 14:11	1
Xylenes, Total	ND		6.0	1.4	ug/L			11/28/20 14:11	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*11/28/20 14:11*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*11/28/20 14:11*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*11/28/20 14:11*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*11/28/20 14:11*	*1*
Toluene-d8 (Surr)	*96*		*80 - 120*		*11/28/20 14:11*	*1*

ARCADIS Design & Consultancy for natural and built assets

Bristol-Myers Squibb

Thompson Road Investigation

Data Usability Summary Report

Syracuse, NY

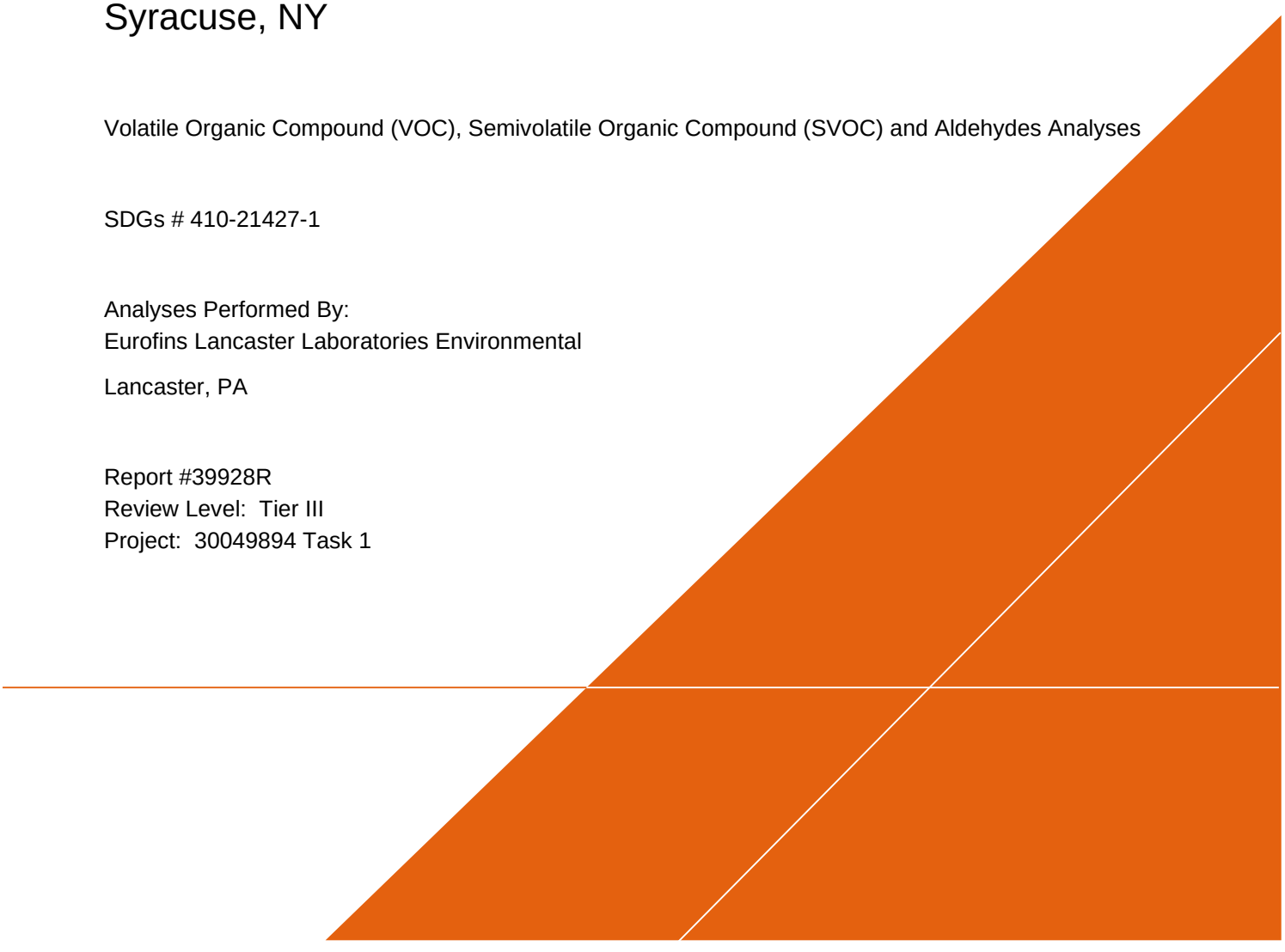
Volatile Organic Compound (VOC), Semivolatile Organic Compound (SVOC) and Aldehydes Analyses

SDGs # 410-21427-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental

Lancaster, PA

Report #39928R
Review Level: Tier III
Project: 30049894 Task 1



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # 410-21427-1 for samples collected in association with the with the Bristol-Myers Squibb Thompson Road Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PFAS	MET	ALD
410-21427-1	EB111820W	410-21427-1	Water	11/18/2020		X	X			X
	B55-PDI-SB-03 11182020	410-21427-2	Water	11/18/2020		X	X			X
	B55-PDI-SB-04 11182020	410-21427-3	Water	11/18/2020		X	X			X
	B55-PDI-SB-05 11182020	410-21427-4	Water	11/18/2020		X	X			X
	B55-PDI-SB-07 11182020	410-21427-5	Water	11/18/2020		X	X			X
	B55-PDI-SB-15 11182020	410-21427-6	Water	11/18/2020		X	X			X
	B55-PDI-SB-16 11182020	410-21427-7	Water	11/18/2020		X	X			X
	B55-PDI-SB-18 11182020	410-21427-8	Water	11/18/2020		X	X			X
	B55-PDI-SB-22 (5.2-6.2) 11182020	410-21427-9	Soil	11/18/2020	Date Collected is 11/17/20	X	X			X
	B55-PDI-SB-10 (9-10) 11182020	410-21427-10	Soil	11/18/2020	Date Collected is 11/12/20	X	X			X
	DUP111820	410-21427-11	Soil	11/18/2020	B55-PDI-SB-10 (9-10)	X	X			X
	TB20308 11182020	410-21427-12	Water	11/18/2020		X				

Date Collected is 11/12/20

Notes:

1. Aldehydes include Acetaldehyde, Formaldehyde and Glutaraldehyde.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

List of Acronyms

%D: Percent Difference

%R: Percent Recovery

AC: Acceptable

ALC/GLY: Alcohols/Glycols

BAL: Blank Action Level

CCV: Continuing Calibration Verification

CRDL: Contract Required Detection Limit

D: Dilution

EIS: Extractable Internal Standard

FB: Field Blank

FD: Field Duplicate

ALD: Aldehydes

GC/ECD: Gas Chromatograph/Electron Capture Detector

GC/MS: Gas Chromatograph/Mass spectrometer

HT: Holding Time

ICP: Inductively Coupled Plasma

ICS: Interference Control Sample

ICV: Initial Calibration Verification

ISTD: Internal Standards

LabDup: Laboratory Duplicate

LCS: Lab Control Sample

LCSD: Lab Control Sample Duplicate

LL: Lower Control Limit

MB: Method Blank

MDL: Method Detection Limit

MET: Metals

MS: Matrix Spike

MSD: Matrix Spike Duplicate

N/A: Not Applicable

NC: Not Compliant

List of Acronyms, Continued

PAH: Polyaromatic Hydrocarbon

PCB: Polychlorinated Biphenyl

PEST: Pesticide

PFAS: Per- and Polyfluoroalkyl Substances

QA: Quality Assurance

QC: Quality Control

RB: Rinse Blank

RL: Reporting Limit

RPD: Relative Percent Difference

RRF: Relative Response Factor

RSD: Relative Standard Deviation

RT: Retention Time

SDG: Sample Delivery Group

SerDil: Serial Dilution

SIM: Single Ion Monitoring

SOP: Standard Operating Procedure

SSTD: Surrogate Standards

SVOC: Semivolatile Organic Compound

TB: Trip Blank

TIC: Tentatively Identified Compound

TOC: Total Organic Carbon

TOTDIS: Total and Dissolved

UL: Upper Control Limit

USEPA: United States Environmental Protection Agency

VOC: Volatile Organic Compound

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW846 methods 8260C, 8270D and 8315A. Data were reviewed in accordance with EPA 540-R-2017-002, January 2017 (with reference to the historical USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999, as appropriate.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.

- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260C	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.
	Soil	48 hours from collection to extraction and 14 days from extraction to analysis	Cool to <6 °C.

Note:

s.u. Standard units

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
B55-PDI-SB-05 11182020 B55-PDI-SB-07 11182020 B55-PDI-SB-15 11182020	Acetone (EB)	Detected sample results <RL and <BAL	"UB" at the RL

Note:

RL Reporting limit

EB Equipment Blank

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
B55-PDI-SB-10 (9-10) 11182020 DUP111820	CCV %D	Bromodichloromethane	21.4%
		cis-1,3-Dichloropropene	22.0%
		2-Nitropropane	116.5%
		Bromoform	21.2%
B55-PDI-SB-22 (5.2-6.2) 11182020	CCV %D	1,4-Dioxane	33.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
B55-PDI-SB-10 (9-10) 11182020 DUP111820	1,2-Dichloroethane-d4	AC
	4-Bromofluorobenzene	> UL
	Dibromofluoromethane	AC
	Toluene-d8	AC

Notes:

Sample Locations	Surrogate	Recovery

UL Upper control limit

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J
< LL but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

6. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
B55-PDI-SB-22 (5.2-6.2) 11182020	1,2,4-Trimethylbenzene	<LL but >10%	AC
	1,3,5-Trimethylbenzene	<LL but >10%	AC
	1,3-Dichlorobenzene	<LL but >10%	AC

Sample Locations	Compound	MS Recovery	MSD Recovery
	1,4-Dichlorobenzene	<LL but >10%	AC
	Acetone	>UL	>UL
	Chlorobenzene	<LL but >10%	AC
	Ethylbenzene	<LL but >10%	AC
	Isopropylbenzene	<LL but >10%	AC
	m&p-Xylene	<LL but >10%	AC
	n-Butylbenzene	<LL but >10%	<LL but >10%
	o-Xylene	<LL but >10%	AC
	p-Isopropyltoluene	<LL but >10%	<LL but >10%
	sec-Butylbenzene	<LL but >10%	<LL but >10%
	Styrene	<LL but >10%	AC
	tert-Butylbenzene	<LL but >10%	AC
	Xylenes, Total	<LL but >10%	AC
	Chlorodifluoromethane	>UL	>UL

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
B55-PDI-SB-10 (9-10) 11182020 DUP111820	Bromoform	>UL	>UL
	2-Nitropropane	>UL	>UL

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
B55-PDI-SB-10 (9-10) 11182020/ DUP111820	Ethylbenzene	0.68	0.95	AC
	m&p-Xylene	1.0	1.2	AC

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
	o-Xylene	0.14 J	0.16 J	AC
	Isopropylbenzene	2.3	2.0	14.0%
	Naphthalene	0.26 J	0.31	AC
	n-Butylbenzene	10	10	0%
	n-Heptane	6.1	4.0	41.6%
	p-Isopropyltoluene	2.1	2.3	9.1%
	sec-Butylbenzene	3.6	3.8	5.4%
	tert-Butylbenzene	0.090 J	0.087 J	AC
	Xylenes, Total	1.1	1.4	AC
	Methylcyclohexane	58	48	18.9%
	1,2,4-Trimethylbenzene	47	38	21.2%

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
B55-PDI-SB-04 11182020	1,2,4-Trimethylbenzene	-	1200	1200 D
	Cyclohexane	-	330	330 D
	Ethylbenzene	-	320	320 D
	m&p-Xylene	-	580	580 D
	Xylenes, Total	-	800	800 D
B55-PDI-SB-10 (9-10) 11182020	Methylcyclohexane	-	58	58 D
	1,2,4-Trimethylbenzene	-	47	47 D
DUP111820	Methylcyclohexane	-	48	48 D
	1,2,4-Trimethylbenzene	-	38	38 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

Tentatively identified compounds (TICs) were identified in all sample locations associated with this SDG. VOC analysis requires that TICs be qualified as estimated (JN).

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X	X		
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)		X	X		
Laboratory Control Sample Duplicate(LCSD)		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)		X	X		
Matrix Spike Duplicate(MSD)		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	

VOCs: SW-846 8260C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

SEMI-VOLATILE ORGANIC COMPOUND (SVOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270D	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
B55-PDI-SB-22 (5.2-6.2) 11182020	TIC Unknown RT: 3.89 TIC 2,5-Dimethylfuran RT: 3.89	Detected sample results less than 5 times blank result	R

Note:

RL Reporting limit

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
B55-PDI-SB-22 (5.2-6.2) 11182020	2-Nitrophenol	<LL but >10%	<LL but >10%
	3,3'-Dichlorobenzidine	<LL but >10%	<LL but >10%
	4,6-Dinitro-2-methylphenol	<LL but >10%	AC
	Caprolactam	<LL but >10%	AC
	Hexachlorocyclopentadiene	<10%	<10%
	Hexachloroethane	<LL but >10%	<LL but >10%
	2,4-Dinitrophenol	<LL but >10%	<LL but >10%
	2,4-Dimethylphenol	<LL but >10%	<LL but >10%

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than the control limit are presented in the following table.

Sample Locations	Compound
B55-PDI-SB-22 (5.2-6.2) 11182020	2,4-Dinitrophenol
	4,6-Dinitro-2-methylphenol
	2-Nitrophenol

Sample Locations	Compound
	3,3'-Dichlorobenzidine
	Hexachloroethane

The criteria used to evaluate the RPD between the MS/MSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
B55-PDI-SB-22 (5.2-6.2) 11182020 B55-PDI-SB-10 (9-10) 11182020 DUP111820	Triethylamine	<LL but >10%	<LL but >10%
B55-PDI-SB-03 11182020 B55-PDI-SB-04 11182020 B55-PDI-SB-05 11182020 B55-PDI-SB-07 11182020 B55-PDI-SB-15 11182020 B55-PDI-SB-16 11182020 B55-PDI-SB-18 11182020	Dicyclohexlamine	<LL but >10%	<LL but >10%

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ

Control Limit	Sample Result	Qualification
	Detect	J
< 10%	Non-detect	R
	Detect	J

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
B55-PDI-SB-10 (9-10) 11182020/ DUP111820	1,1'-Biphenyl	0.053	0.046 U	AC
	Anthracene	0.018 J	0.021 U	AC
	Benzo[a]pyrene	0.021 U	0.0057 J	AC
	Benzo[b]fluoranthene	0.021 U	0.0074 J	AC
	Bis(2-ethylhexyl) phthalate	0.21 U	0.31	AC
	Fluoranthene	0.021 U	0.010 J	AC
	Chrysene	0.021 U	0.0094 J	AC
	Fluorene	0.036	0.026	AC
	Phenanthrene	0.084	0.061	AC
	Pyrene	0.025	0.022	AC
	Dicyclohexylamine	21	23	AC

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
B55-PDI-SB-04 11182020	Dicyclohexylamine	-	1100	1100 DJ
B55-PDI-SB-22 (5.2-6.2) 11182020	Dicyclohexylamine	-	24	24 D
B55-PDI-SB-10 (9-10) 11182020	Dicyclohexylamine	-	21	21 D
DUP111820	Dicyclohexylamine	-	23	23 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

Tentatively identified compounds (TICs) were identified in all sample locations associated with this SDG. SVOC analysis requires that TICs be qualified as estimated (JN).

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270D and 8270D-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
D. Method blanks		X		X	
E. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X	X		
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
F. Reconstructed ion chromatograms		X		X	
G. Quantitation Reports		X		X	

SVOCs: SW-846 8270D and 8270D-SIM		Reported		Performance Acceptable		Not Required
		No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)						
H.	RT of sample compounds within the established RT windows		X		X	
I.	Quantitation transcriptions/calculations		X		X	
J.	Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

ALDEHYDES ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8315A	Water	3 days until extraction; 3 days from extraction to analysis	Cool to <6 °C
	Soil	14 days until extraction; 3 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% is allowed or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires that the surrogate compound exhibits recovery within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
B55-PDI-SB-10 (9-10) 11182020/ DUP111820	Acetaldehyde	0.064 U	0.036 J	AC
	Formaldehyde	0.27	1.2	NC

Notes:

AC Acceptable

NC Not compliant

The calculated RPDs between the parent sample and field duplicate were acceptable.

9. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows.

All identified compounds met the specified criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL GC

Aldehyde: SW846 8315A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/FID)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X	X		
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

SAMPLE COMPLIANCE REPORT

Sample Delivery Group (SDG)	Sampling Date	Protocol	Sample ID	Matrix	Compliancy[1]					Noncompliance
					VOC	SVOC	ALD	PFAS	MET	
410-21427-1	11/18/2020	SW846	EB111820W	Water	Yes	No	Yes	-	-	SVOC: LCS/LCSD %R
	11/18/2020	SW846	B55-PDI-SB-03 11182020	Soil	Yes	No	Yes	-	-	SVOC: LCS/LCSD %R
	11/18/2020	SW846	B55-PDI-SB-04 11182020	Soil	No	No	Yes	-	-	VOC: Dilution SVOC: LCS/LCSD %R, Dilution
	11/18/2020	SW846	B55-PDI-SB-05 11182020	Soil	No	No	Yes	-	-	VOC: EB SVOC: LCS/LCSD %R
	11/18/2020	SW846	B55-PDI-SB-07 11182020	Soil	No	No	Yes	-	-	VOC: EB SVOC: LCS/LCSD %R
	11/18/2020	SW846	B55-PDI-SB-15 11182020	Soil	No	No	Yes	-	-	VOC: EB SVOC: LCS/LCSD %R
	11/18/2020	SW846	B55-PDI-SB-16 11182020	Soil	Yes	No	Yes	-	-	SVOC: LCS/LCSD %R
	11/18/2020	SW846	B55-PDI-SB-18 11182020	Soil	Yes	No	Yes	-	-	SVOC: LCS/LCSD %R
	11/18/2020	SW846	B55-PDI-SB-22 (5.2-6.2) 11182020	Soil	No	No	Yes	-	-	VOC: MS/MSD %R SVOC: MS/MSD %R/RPD, Dilution
	11/18/2020	SW846	B55-PDI-SB-10 (9-10) 11182020	Soil	No	No	No	-	-	VOC: SSTD %R, CCV %D, Dilution SVOC: LCS/LCSD %R, Dilution ALD: FD RPD
	11/18/2020	SW846	DUP111820	Soil	No	No	No	-	-	VOC: SSTD %R, CCV %D, Dilution SVOC: LCS/LCSD %R, Dilution ALD: FD RPD
	11/18/2020	SW846	TB20308 11182020	Water	Yes	-	-	-	-	

Note:

1 Samples which are compliant with no added validation qualifiers are listed as "yes". Samples which are non-compliant or which have added qualifiers are listed as "no". A "no" designation does not necessarily indicate that the data have been rejected or are otherwise unusable.

VALIDATION PERFORMED BY: Jeffrey L. Davin

SIGNATURE: 

DATE: January 21, 2021

PEER REVIEW: Dennis K. Capria

DATE: January 25, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Environmental Analysis

Custody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-21427 Chain of Custody

...mental use only

COC #605303

Client Information

Client: Arcadis	Acct. #:
Project Name/#: Bristol-Myers Squibb	PWSID #:
Project Manager: William McClure	P.O. #:
Sampler: Joshua Miller	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☒

For Lab Use Only
FSC:_____
SCR#:_____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Remarks

Sample Identification	Collected Date	Collected Time	Grab	Composite	Matrix: Soil	Sediment	Tissue	Water	Ground	Potable	NPDES	Surface	Other:	Total # of Containers	Analysis Requested: Short-List Aldehydes 8315A	VOCs Water 8260C	SVOAs 8270D MINI	Short-List Aldehydes 8315A	SVOAs 8270D/E (Microwave)	VOCs Solid by 8260 C/D
EB111820W	11/18/20	0800	X					X						6	X	X	X			
B55-PDI-SB-03		0830	X					X						6	X	X	X			
B55-PDI-SB-04		0845	X					X						6	X	X	X			
B55-PDI-SB-05		0900	X					X						6	X	X	X			
B55-PDI-SB-07		0930	X					X						6	X	X	X			
B55-PDI-SB-15		1000	X					X						6	X	X	X			
B55-PDI-SB-16		1045	X					X						6	X	X	X			
B55-PDI-SB-18		1200	X					X						6	X	X	X			
B55-PDI-SB-22 (5.2-6.2)		1210		X	X									14				X	X	X
B55-PDI-SB-10 (9-10)	↓	1230		X	X									5				X	X	X

Date Collected is 11/17/20

Date Collected is 11/12/20

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: Standard

E-mail address: William.McClure@arcadis.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP)
Type VI (Raw Data Only)
Type III (Reduced non-CLP)
NJ DKQP
TX TRRP-13
NYSDEC Category A or B
MA MCP
CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	11/18/20	1300			
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	11/19/20	1118

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx X Other _____

Temperature upon receipt 3.3 °C

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # _____ Group # _____ Sample # _____

COC #605305

Client Information

Client: Arcadis	Acct. #:
Project Name/#: Bristol-Myers Squibb	PWSID #:
Project Manager: William McCune	P.O. #:
Sampler: Joshua Miller	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☑

Matrix: Soil ☒ Sediment ☐ Tissue ☐ | Water: Potable ☒ Ground ☐ NPDES ☐ Surface ☐ | Other: ___

Total # of Containers: 5 | 3

Analysis Requested — Preservation and Filtration Codes

For Lab Use Only
FSC: _____
SCR#: _____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Short List Aldehydes 5835A	SVOAs 8270 D/E (Microwave)	VOCs Soil by 8260 C/D	Short-List Aldehydes WS5619	VOLs Water 8260C	SVOAs 8270 MINI	Remarks
DUP 111820	11/18/20	—		✓	X	X	X				Date Collected is 11/12/20
TB20308	11/15/20	LAB	PRESERVED				X				

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: Standard

E-mail address: William.McCune@arcadis.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	11/18/20	1300			
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	11/19/20	1119

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx X Other _____

Temperature upon receipt 3.3 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • FOR HELP COMPLETING FORM CHECK OUT https://www.eurofinsus.com/coc

The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*1	LCS/LCSD RPD exceeds control limits.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit

Client Sample ID: EB111820W
Lab Sample ID: 410-21427-1

Date Collected: 11/18/20 08:00
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 13:21	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 13:21	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 13:21	1
1,2,4-Trimethylbenzene	ND		5.0	1.0	ug/L			12/01/20 13:21	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 13:21	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 13:21	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
1,3,5-Trimethylbenzene	ND		5.0	0.30	ug/L			12/01/20 13:21	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 13:21	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 13:21	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 13:21	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 13:21	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 13:21	1
Acetone	**1.4**	**J**	20	0.70	ug/L			12/01/20 13:21	1
Acetonitrile	ND		100	16	ug/L			12/01/20 13:21	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 13:21	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 13:21	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 13:21	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 13:21	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 13:21	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Cyclohexane	ND		5.0	1.0	ug/L			12/01/20 13:21	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 13:21	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 13:21	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 13:21	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/01/20 13:21	1
Freon 113	ND		10	0.20	ug/L			12/01/20 13:21	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 13:21	1
Isopropylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
m&p-Xylene	ND		5.0	1.0	ug/L			12/01/20 13:21	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 13:21	1

Client Sample ID: EB111820W

Date Collected: 11/18/20 08:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-1

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Methylcyclohexane	ND		5.0	0.50	ug/L			12/01/20 13:21	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 13:21	1
Naphthalene	ND		5.0	1.0	ug/L			12/01/20 13:21	1
n-Butanol	ND		250	61	ug/L			12/01/20 13:21	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 13:21	1
o-Xylene	ND		1.0	0.40	ug/L			12/01/20 13:21	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 13:21	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 13:21	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 13:21	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 13:21	1
Toluene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 13:21	1
Xylenes, Total	ND		6.0	1.4	ug/L			12/01/20 13:21	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 13:21*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/20 13:21*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*12/01/20 13:21*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*12/01/20 13:21*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*12/01/20 13:21*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
1,2,4,5-Tetrachlorobenzene	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,2'-oxybis[1-chloropropane]	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,3,4,6-Tetrachlorophenol	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4,5-Trichlorophenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4,6-Trichlorophenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4-Dichlorophenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4-Dimethylphenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4-Dinitrophenol	ND		31	14	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,4-Dinitrotoluene	ND		5.1	1.0	ug/L		11/25/20 10:15	12/02/20 06:06	1
2,6-Dinitrotoluene	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2-Chloronaphthalene	ND		1.0	0.41	ug/L		11/25/20 10:15	12/02/20 06:06	1
2-Chlorophenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2-Methylnaphthalene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
2-Methylphenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
2-Nitroaniline	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1

Client Sample ID: EB111820W

Date Collected: 11/18/20 08:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-1

Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
3,3'-Dichlorobenzidine	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
3-Nitroaniline	ND		7.2	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
4,6-Dinitro-2-methylphenol	ND		22	8.2	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Bromophenyl-phenylether	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Chloro-3-methylphenol	ND		3.6	1.6	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Chloroaniline	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Chlorophenyl-phenyl ether	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
3,4-Methylphenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Nitroaniline	ND		3.1	0.92	ug/L		11/25/20 10:15	12/02/20 06:06	1
4-Nitrophenol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Acenaphthene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Acenaphthylene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Acetophenone	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Aniline	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Anthracene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Atrazine	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzaldehyde	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzo[a]anthracene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzo[a]pyrene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzo[b]fluoranthene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzo[g,h,i]perylene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzo[k]fluoranthene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Benzyl alcohol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Butylbenzylphthalate	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Caprolactam	ND		11	5.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Carbazole	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Chrysene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Di-n-butyl phthalate	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Di-n-octyl phthalate	ND		11	5.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Dibenz(a,h)anthracene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Dibenzofuran	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Dicyclohexylamine	ND	*-*1 J	21	10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Diethyl phthalate	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Dimethyl phthalate	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Fluoranthene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Fluorene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Hexachlorobenzene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Hexachlorobutadiene	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Hexachlorocyclopentadiene	ND		11	5.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Hexachloroethane	ND		5.1	1.0	ug/L		11/25/20 10:15	12/02/20 06:06	1
Indeno[1,2,3-cd]pyrene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Isophorone	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
n,n'-Dimethylaniline	ND		1.0	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
N-Nitrosodi-n-propylamine	ND		3.1	0.72	ug/L		11/25/20 10:15	12/02/20 06:06	1
N-Nitrosodiphenylamine	ND		3.1	0.72	ug/L		11/25/20 10:15	12/02/20 06:06	1
Naphthalene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Nitrobenzene	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Pentachlorophenol	ND		5.1	1.0	ug/L		11/25/20 10:15	12/02/20 06:06	1

Client Sample ID: EB111820W
Lab Sample ID: 410-21427-1

Date Collected: 11/18/20 08:00
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenanthrene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Phenol	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Pyrene	ND		0.51	0.10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Pyridine	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
Triethylamine	ND		10	10	ug/L		11/25/20 10:15	12/02/20 06:06	1
Bis(2-chloroethoxy)methane	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Bis(2-chloroethyl)ether	ND		2.1	0.51	ug/L		11/25/20 10:15	12/02/20 06:06	1
Bis(2-ethylhexyl) phthalate	ND		11	5.1	ug/L		11/25/20 10:15	12/02/20 06:06	1
1,4-Dioxane	ND		5.1	2.1	ug/L		11/25/20 10:15	12/02/20 06:06	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*11/25/20 10:15*	*12/02/20 06:06*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*83*		*10 - 150*	*11/25/20 10:15*	*12/02/20 06:06*	*1*
2-Fluorobiphenyl (Surr)	*74*		*44 - 102*	*11/25/20 10:15*	*12/02/20 06:06*	*1*
2-Fluorophenol (Surr)	*48*		*10 - 84*	*11/25/20 10:15*	*12/02/20 06:06*	*1*
Nitrobenzene-d5 (Surr)	*75*		*23 - 128*	*11/25/20 10:15*	*12/02/20 06:06*	*1*
p-Terphenyl-d14 (Surr)	*87*		*31 - 113*	*11/25/20 10:15*	*12/02/20 06:06*	*1*
Phenol-d5 (Surr)	*36*		*10 - 67*	*11/25/20 10:15*	*12/02/20 06:06*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 20:16	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 20:16	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 20:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*98*		*39 - 153*	*11/20/20 16:15*	*11/23/20 20:16*	*1*

Client Sample ID: B55-PDI-SB-03
Lab Sample ID: 410-21427-2

Date Collected: 11/18/20 08:30
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 16:40	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 16:40	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 16:40	1
1,2,4-Trimethylbenzene	**4.2**	**J**	5.0	1.0	ug/L			12/01/20 16:40	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 16:40	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 16:40	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
1,3,5-Trimethylbenzene	**0.93**	**J**	5.0	0.30	ug/L			12/01/20 16:40	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 16:40	1

Client Sample ID: B55-PDI-SB-03
Date Collected: 11/18/20 08:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-2
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 16:40	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 16:40	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 16:40	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 16:40	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 16:40	1
Acetone	ND		20	0.70	ug/L			12/01/20 16:40	1
Acetonitrile	ND		100	16	ug/L			12/01/20 16:40	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 16:40	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 16:40	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 16:40	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 16:40	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 16:40	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Chloroform	**2.1**		1.0	0.20	ug/L			12/01/20 16:40	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Cyclohexane	**1.6**	**J**	5.0	1.0	ug/L			12/01/20 16:40	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 16:40	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 16:40	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 16:40	1
Ethylbenzene	**1.2**		1.0	0.40	ug/L			12/01/20 16:40	1
Freon 113	ND		10	0.20	ug/L			12/01/20 16:40	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 16:40	1
Isopropylbenzene	**0.23**	**J**	5.0	0.20	ug/L			12/01/20 16:40	1
m&p-Xylene	**2.2**	**J**	5.0	1.0	ug/L			12/01/20 16:40	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 16:40	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Methylcyclohexane	**0.72**	**J**	5.0	0.50	ug/L			12/01/20 16:40	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 16:40	1
Naphthalene	ND		5.0	1.0	ug/L			12/01/20 16:40	1
n-Butanol	ND		250	61	ug/L			12/01/20 16:40	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 16:40	1
o-Xylene	**0.73**	**J**	1.0	0.40	ug/L			12/01/20 16:40	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 16:40	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 16:40	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 16:40	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 16:40	1

Client Sample ID: B55-PDI-SB-03

Date Collected: 11/18/20 08:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-2

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 16:40	1
Xylenes, Total	**2.9**	**J**	6.0	1.4	ug/L			12/01/20 16:40	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 16:40*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/20 16:40*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*12/01/20 16:40*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*12/01/20 16:40*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 16:40*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
1,2,4,5-Tetrachlorobenzene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,2'-oxybis[1-chloropropane]	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,3,4,6-Tetrachlorophenol	ND		10	4.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4,5-Trichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4,6-Trichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4-Dichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4-Dimethylphenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4-Dinitrophenol	ND		31	15	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,4-Dinitrotoluene	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 06:34	1
2,6-Dinitrotoluene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Chloronaphthalene	ND		1.0	0.42	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Chlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Methylnaphthalene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Methylphenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Nitroaniline	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
2-Nitrophenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
3,3'-Dichlorobenzidine	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
3-Nitroaniline	ND		7.3	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
4,6-Dinitro-2-methylphenol	ND		22	8.3	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Bromophenyl-phenylether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Chloro-3-methylphenol	ND		3.6	1.7	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Chloroaniline	ND		10	4.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Chlorophenyl-phenyl ether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
3,4-Methylphenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Nitroaniline	ND		3.1	0.94	ug/L		11/25/20 10:15	12/02/20 06:34	1
4-Nitrophenol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Acenaphthene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Acenaphthylene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Acetophenone	ND		10	4.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
Aniline	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1

Client Sample ID: B55-PDI-SB-03

Date Collected: 11/18/20 08:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-2

Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anthracene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Atrazine	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzaldehyde	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzo[a]anthracene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzo[a]pyrene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzo[b]fluoranthene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzo[g,h,i]perylene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzo[k]fluoranthene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Benzyl alcohol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Butylbenzylphthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Caprolactam	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
Carbazole	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Chrysene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Di-n-butyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Di-n-octyl phthalate	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
Dibenz(a,h)anthracene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Dibenzofuran	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Dicyclohexylamine	ND	*- *T J	21	10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Diethyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Dimethyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Fluoranthene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Fluorene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Hexachlorobenzene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Hexachlorobutadiene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Hexachlorocyclopentadiene	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
Hexachloroethane	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 06:34	1
Indeno[1,2,3-cd]pyrene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Isophorone	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
n,n'-Dimethylaniline	ND		1.0	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
N-Nitrosodi-n-propylamine	ND		3.1	0.73	ug/L		11/25/20 10:15	12/02/20 06:34	1
N-Nitrosodiphenylamine	ND		3.1	0.73	ug/L		11/25/20 10:15	12/02/20 06:34	1
Naphthalene	**0.23**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Nitrobenzene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Pentachlorophenol	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 06:34	1
Phenanthrene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Phenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Pyrene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Pyridine	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1
Triethylamine	ND		10	10	ug/L		11/25/20 10:15	12/02/20 06:34	1
Bis(2-chloroethoxy)methane	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Bis(2-chloroethyl)ether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 06:34	1
Bis(2-ethylhexyl) phthalate	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 06:34	1
1,4-Dioxane	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 06:34	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*5.0*	*T J N*	*ug/L*		*18.69*		*11/25/20 10:15*	*12/02/20 06:34*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*85*		*10 - 150*	*11/25/20 10:15*	*12/02/20 06:34*	*1*
2-Fluorobiphenyl (Surr)	*78*		*44 - 102*	*11/25/20 10:15*	*12/02/20 06:34*	*1*

Client Sample ID: B55-PDI-SB-03
Lab Sample ID: 410-21427-2

Date Collected: 11/18/20 08:30
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*53*		*10 - 84*	*11/25/20 10:15*	*12/02/20 06:34*	*1*
Nitrobenzene-d5 (Surr)	*79*		*23 - 128*	*11/25/20 10:15*	*12/02/20 06:34*	*1*
p-Terphenyl-d14 (Surr)	*59*		*31 - 113*	*11/25/20 10:15*	*12/02/20 06:34*	*1*
Phenol-d5 (Surr)	*40*		*10 - 67*	*11/25/20 10:15*	*12/02/20 06:34*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 20:27	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 20:27	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 20:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*102*		*39 - 153*	*11/20/20 16:15*	*11/23/20 20:27*	*1*

Client Sample ID: B55-PDI-SB-04
Lab Sample ID: 410-21427-3

Date Collected: 11/18/20 08:45
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 17:02	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
1,1,2-Trichloroethane	**26**		1.0	0.20	ug/L			12/01/20 17:02	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 17:02	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 17:02	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 17:02	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:02	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 17:02	1
1,2-Dichloropropane	**4.0**		1.0	0.20	ug/L			12/01/20 17:02	1
1,3,5-Trimethylbenzene	**300**		5.0	0.30	ug/L			12/01/20 17:02	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:02	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:02	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 17:02	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 17:02	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 17:02	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 17:02	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 17:02	1
Acetone	**16**	**J**	20	0.70	ug/L			12/01/20 17:02	1
Acetonitrile	ND		100	16	ug/L			12/01/20 17:02	1
Benzene	**0.93**	**J**	1.0	0.20	ug/L			12/01/20 17:02	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 17:02	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 17:02	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 17:02	1
Carbon disulfide	**0.29**	**J**	5.0	0.20	ug/L			12/01/20 17:02	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 17:02	1

Client Sample ID: B55-PDI-SB-04

Date Collected: 11/18/20 08:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-3

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 17:02	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 17:02	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 17:02	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 17:02	1
Freon 113	ND		10	0.20	ug/L			12/01/20 17:02	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 17:02	1
Isopropylbenzene	**82**		5.0	0.20	ug/L			12/01/20 17:02	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 17:02	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Methylcyclohexane	**220**		5.0	0.50	ug/L			12/01/20 17:02	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 17:02	1
Naphthalene	**170**		5.0	1.0	ug/L			12/01/20 17:02	1
n-Butanol	ND		250	61	ug/L			12/01/20 17:02	1
n-Butylbenzene	**30**		5.0	0.20	ug/L			12/01/20 17:02	1
n-Heptane	**37**		5.0	2.0	ug/L			12/01/20 17:02	1
o-Xylene	**280**		1.0	0.40	ug/L			12/01/20 17:02	1
p-Isopropyltoluene	**7.0**		5.0	0.20	ug/L			12/01/20 17:02	1
sec-Butylbenzene	**12**		5.0	0.20	ug/L			12/01/20 17:02	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 17:02	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 17:02	1
tert-Butylbenzene	**0.59**	**J**	5.0	0.30	ug/L			12/01/20 17:02	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 17:02	1
Toluene	**9.9**		1.0	0.20	ug/L			12/01/20 17:02	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:02	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 17:02	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Butane, 2-methyl-	*420*	*T J N*	*ug/L*		*2.91*	*78-78-4*		*12/01/20 17:02*	*1*
Pentane	*230*	*T J N*	*ug/L*		*3.13*	*109-66-0*		*12/01/20 17:02*	*1*
Cyclopentane, methyl-	*370*	*T J N*	*ug/L*		*6.13*	*96-37-7*		*12/01/20 17:02*	*1*
Benzene, propyl-	*190*	*T J N*	*ug/L*		*12.47*	*103-65-1*		*12/01/20 17:02*	*1*
Benzene, 1-ethyl-2-methyl-	*460*	*T J N*	*ug/L*		*12.53*	*611-14-3*		*12/01/20 17:02*	*1*
Benzene, 1,2,3-trimethyl-	*350*	*T J N*	*ug/L*		*12.56*	*526-73-8*		*12/01/20 17:02*	*1*
Benzene, 1-ethyl-3-methyl-	*360*	*T J N*	*ug/L*		*12.75*	*620-14-4*		*12/01/20 17:02*	*1*
Benzene, cyclopropyl-	*310*	*T J N*	*ug/L*		*13.35*	*873-49-4*		*12/01/20 17:02*	*1*
Benzene, 1-ethyl-2,3-dimethyl-	*180*	*T J N*	*ug/L*		*13.65*	*933-98-2*		*12/01/20 17:02*	*1*
3-Phenylbut-1-ene	*300*	*T J N*	*ug/L*		*14.27*	*934-10-1*		*12/01/20 17:02*	*1*

Client Sample ID: B55-PDI-SB-04
Date Collected: 11/18/20 08:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-3
Matrix: Groundwater

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*80 - 120*		*12/01/20 17:02*	*1*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*12/01/20 17:02*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 120*		*12/01/20 17:02*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 17:02*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	**1200**	D	50	10	ug/L			12/02/20 17:59	10
Cyclohexane	**330**	D	50	10	ug/L			12/02/20 17:59	10
Ethylbenzene	**320**	D	10	4.0	ug/L			12/02/20 17:59	10
m&p-Xylene	**580**	D	50	10	ug/L			12/02/20 17:59	10
Xylenes, Total	**800**	D	60	14	ug/L			12/02/20 17:59	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*12/02/20 17:59*	*10*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*12/02/20 17:59*	*10*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*12/02/20 17:59*	*10*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/02/20 17:59*	*10*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
1,2,4,5-Tetrachlorobenzene	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,2'-oxybis[1-chloropropane]	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,3,4,6-Tetrachlorophenol	ND		13	5.1	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4,5-Trichlorophenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4,6-Trichlorophenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4-Dichlorophenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4-Dimethylphenol	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4-Dinitrophenol	ND		38	18	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,4-Dinitrotoluene	ND		6.4	1.3	ug/L		11/25/20 10:15	12/02/20 07:02	1
2,6-Dinitrotoluene	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Chloronaphthalene	ND		1.3	0.51	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Chlorophenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Methylnaphthalene	**46**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Methylphenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Nitroaniline	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
2-Nitrophenol	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
3,3'-Dichlorobenzidine	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
3-Nitroaniline	ND		8.9	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
4,6-Dinitro-2-methylphenol	ND		27	10	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Bromophenyl-phenylether	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Chloro-3-methylphenol	ND		4.5	2.0	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Chloroaniline	ND		13	5.1	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Chlorophenyl-phenyl ether	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
3,4-Methylphenol	**3.5**		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Nitroaniline	ND		3.8	1.1	ug/L		11/25/20 10:15	12/02/20 07:02	1
4-Nitrophenol	ND		38	13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Acenaphthene	**1.4**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Acenaphthylene	ND		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Acetophenone	ND		13	5.1	ug/L		11/25/20 10:15	12/02/20 07:02	1

Client Sample ID: B55-PDI-SB-04
Date Collected: 11/18/20 08:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-3
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aniline	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
Anthracene	**0.66**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Atrazine	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzaldehyde	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzo[a]anthracene	**0.41**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzo[a]pyrene	**0.37**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzo[b]fluoranthene	**0.41**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzo[g,h,i]perylene	**0.21**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzo[k]fluoranthene	**0.20**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Benzyl alcohol	ND		38	13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Butylbenzylphthalate	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Caprolactam	ND		14	6.4	ug/L		11/25/20 10:15	12/02/20 07:02	1
Carbazole	**2.1**	**J**	2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Chrysene	**0.42**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Di-n-butyl phthalate	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Di-n-octyl phthalate	ND		14	6.4	ug/L		11/25/20 10:15	12/02/20 07:02	1
Dibenz(a,h)anthracene	ND		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Dibenzofuran	**1.1**	**J**	2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Diethyl phthalate	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Dimethyl phthalate	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Fluoranthene	**1.3**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Fluorene	**1.5**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Hexachlorobenzene	**0.46**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Hexachlorobutadiene	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Hexachlorocyclopentadiene	ND		14	6.4	ug/L		11/25/20 10:15	12/02/20 07:02	1
Hexachloroethane	ND		6.4	1.3	ug/L		11/25/20 10:15	12/02/20 07:02	1
Indeno[1,2,3-cd]pyrene	**0.23**	**J**	0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Isophorone	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
n,n'-Dimethylaniline	ND		1.3	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
N-Nitrosodi-n-propylamine	ND		3.8	0.89	ug/L		11/25/20 10:15	12/02/20 07:02	1
N-Nitrosodiphenylamine	ND		3.8	0.89	ug/L		11/25/20 10:15	12/02/20 07:02	1
Naphthalene	**51**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Nitrobenzene	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Pentachlorophenol	ND		6.4	1.3	ug/L		11/25/20 10:15	12/02/20 07:02	1
Phenanthrene	**2.7**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Phenol	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Pyrene	**1.0**		0.64	0.13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Pyridine	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1
Triethylamine	ND		13	13	ug/L		11/25/20 10:15	12/02/20 07:02	1
Bis(2-chloroethoxy)methane	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Bis(2-chloroethyl)ether	ND		2.5	0.64	ug/L		11/25/20 10:15	12/02/20 07:02	1
Bis(2-ethylhexyl) phthalate	ND		14	6.4	ug/L		11/25/20 10:15	12/02/20 07:02	1
1,4-Dioxane	ND		6.4	2.5	ug/L		11/25/20 10:15	12/02/20 07:02	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Ethylbenzene	*150*	*T J N*	*ug/L*		*4.60*	*100-41-4*	*11/25/20 10:15*	*12/02/20 07:02*	*1*
p-Xylene	*200*	*T J N*	*ug/L*		*5.06*	*106-42-3*	*11/25/20 10:15*	*12/02/20 07:02*	*1*
Benzene, propyl-	*70*	*T J N*	*ug/L*		*5.89*	*103-65-1*	*11/25/20 10:15*	*12/02/20 07:02*	*1*
Benzene, (1-methylethyl)-	*440*	*T J N*	*ug/L*		*5.99*	*98-82-8*	*11/25/20 10:15*	*12/02/20 07:02*	*1*
Benzene, 1-ethyl-3-methyl-	*330*	*T J N*	*ug/L*		*6.04*	*620-14-4*	*11/25/20 10:15*	*12/02/20 07:02*	*1*

Client Sample ID: B55-PDI-SB-04

Date Collected: 11/18/20 08:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-3

Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Benzene, 1,2,3-trimethyl-	310	T J N	ug/L		6.10	526-73-8	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1-ethyl-4-methyl-	360	T J N	ug/L		6.21	622-96-8	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1,3,5-trimethyl-	810	T J N	ug/L		6.42	108-67-8	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1-ethyl-2-methyl-	420	T J N	ug/L		6.75	611-14-3	11/25/20 10:15	12/02/20 07:02	1
Indane	170	T J N	ug/L		6.92	496-11-7	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1,3-diethyl-	77	T J N	ug/L		7.05	141-93-5	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1-methyl-3-propyl-	110	T J N	ug/L		7.09	1074-43-7	11/25/20 10:15	12/02/20 07:02	1
Benzene, 4-ethyl-1,2-dimethyl-	250	T J N	ug/L		7.16	934-80-5	11/25/20 10:15	12/02/20 07:02	1
Benzene, 2-ethyl-1,4-dimethyl-	100	T J N	ug/L		7.37	1758-88-9	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1-methyl-4-(1-methylethyl)-	82	T J N	ug/L		7.41	99-87-6	11/25/20 10:15	12/02/20 07:02	1
Indan, 1-methyl-	140	T J N	ug/L		7.51	767-58-8	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1,2,4,5-tetramethyl-	120	T J N	ug/L		7.83	95-93-2	11/25/20 10:15	12/02/20 07:02	1
Benzene, 1,2,3,4-tetramethyl-	150	T J N	ug/L		7.88	488-23-3	11/25/20 10:15	12/02/20 07:02	1
Benzene, 2-ethenyl-1,4-dimethyl-	170	T J N	ug/L		8.10	2039-89-6	11/25/20 10:15	12/02/20 07:02	1
Benzene, (2-methyl-1-propenyl)-	300	T J N	ug/L		8.20	768-49-0	11/25/20 10:15	12/02/20 07:02	1
Unknown	69	T J N	ug/L		8.28		11/25/20 10:15	12/02/20 07:02	1
Naphthalene, 1,2,3,4-tetrahydro-	63	T J N	ug/L		8.35	119-64-2	11/25/20 10:15	12/02/20 07:02	1
Unknown	66	T J N	ug/L		8.67		11/25/20 10:15	12/02/20 07:02	1
1H-Indene,2,3-dihydro-2,2-dimethyl-	59	T J N	ug/L		8.69	20836-11-7	11/25/20 10:15	12/02/20 07:02	1
Unknown	210	T J N	ug/L		10.89		11/25/20 10:15	12/02/20 07:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	79		10 - 150	11/25/20 10:15	12/02/20 07:02	1
2-Fluorobiphenyl (Surr)	71		44 - 102	11/25/20 10:15	12/02/20 07:02	1
2-Fluorophenol (Surr)	54		10 - 84	11/25/20 10:15	12/02/20 07:02	1
Nitrobenzene-d5 (Surr)	76		23 - 128	11/25/20 10:15	12/02/20 07:02	1
p-Terphenyl-d14 (Surr)	43		31 - 113	11/25/20 10:15	12/02/20 07:02	1
Phenol-d5 (Surr)	45		10 - 67	11/25/20 10:15	12/02/20 07:02	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**1100**	~~*4~~ DJ	250	130	ug/L		11/25/20 10:15	12/02/20 17:10	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	79		10 - 150	11/25/20 10:15	12/02/20 17:10	10
2-Fluorobiphenyl (Surr)	85		44 - 102	11/25/20 10:15	12/02/20 17:10	10
2-Fluorophenol (Surr)	58		10 - 84	11/25/20 10:15	12/02/20 17:10	10
Nitrobenzene-d5 (Surr)	87		23 - 128	11/25/20 10:15	12/02/20 17:10	10
p-Terphenyl-d14 (Surr)	48		31 - 113	11/25/20 10:15	12/02/20 17:10	10
Phenol-d5 (Surr)	51		10 - 67	11/25/20 10:15	12/02/20 17:10	10

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 20:39	1
Formaldehyde	**30**	**J**	50	20	ug/L		11/20/20 16:15	11/23/20 20:39	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 20:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	107		39 - 153	11/20/20 16:15	11/23/20 20:39	1

Client Sample ID: B55-PDI-SB-05
Date Collected: 11/18/20 09:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-4
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte		Result	Qualifier		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane		ND			1.0	0.30	ug/L			12/01/20 17:24	1
1,1,2,2-Tetrachloroethane		ND			1.0	0.20	ug/L			12/01/20 17:24	1
1,1,2-Trichloroethane		ND			1.0	0.20	ug/L			12/01/20 17:24	1
1,1-Dichloroethane		ND			1.0	0.20	ug/L			12/01/20 17:24	1
1,1-Dichloroethene		ND			1.0	0.20	ug/L			12/01/20 17:24	1
1,2,3-Trichlorobenzene		ND			5.0	0.40	ug/L			12/01/20 17:24	1
1,2,4-Trichlorobenzene		ND			5.0	0.30	ug/L			12/01/20 17:24	1
1,2,4-Trimethylbenzene		**7.4**			5.0	1.0	ug/L			12/01/20 17:24	1
1,2-Dibromo-3-Chloropropane		ND			5.0	0.30	ug/L			12/01/20 17:24	1
1,2-Dibromoethane		ND			1.0	0.20	ug/L			12/01/20 17:24	1
1,2-Dichlorobenzene		ND			5.0	0.20	ug/L			12/01/20 17:24	1
1,2-Dichloroethane		ND			1.0	0.30	ug/L			12/01/20 17:24	1
1,2-Dichloropropane		ND			1.0	0.20	ug/L			12/01/20 17:24	1
1,3,5-Trimethylbenzene		**1.6**	**J**		5.0	0.30	ug/L			12/01/20 17:24	1
1,3-Dichlorobenzene		ND			5.0	0.20	ug/L			12/01/20 17:24	1
1,4-Dichlorobenzene		ND			5.0	0.20	ug/L			12/01/20 17:24	1
1,4-Dioxane		ND			250	29	ug/L			12/01/20 17:24	1
2-Butanone		ND			10	0.30	ug/L			12/01/20 17:24	1
2-Hexanone		ND			10	0.30	ug/L			12/01/20 17:24	1
2-Nitropropane		ND			10	0.80	ug/L			12/01/20 17:24	1
4-Methyl-2-pentanone		ND			10	0.50	ug/L			12/01/20 17:24	1
Acetone	20	~~1.9~~	~~J~~	UB	20	0.70	ug/L			12/01/20 17:24	1
Acetonitrile		ND			100	16	ug/L			12/01/20 17:24	1
Benzene		ND			1.0	0.20	ug/L			12/01/20 17:24	1
Bromochloromethane		ND			5.0	0.20	ug/L			12/01/20 17:24	1
Bromodichloromethane		ND			1.0	0.20	ug/L			12/01/20 17:24	1
Bromoform		ND			4.0	1.0	ug/L			12/01/20 17:24	1
Bromomethane		ND			1.0	0.30	ug/L			12/01/20 17:24	1
Carbon disulfide		**0.25**	**J**		5.0	0.20	ug/L			12/01/20 17:24	1
Carbon tetrachloride		ND			1.0	0.20	ug/L			12/01/20 17:24	1
Chlorobenzene		ND			1.0	0.20	ug/L			12/01/20 17:24	1
Chlorodifluoromethane		ND			5.0	2.0	ug/L			12/01/20 17:24	1
Chloroethane		ND			1.0	0.20	ug/L			12/01/20 17:24	1
Chloroform		**0.61**	**J**		1.0	0.20	ug/L			12/01/20 17:24	1
Chloromethane		ND			1.0	0.20	ug/L			12/01/20 17:24	1
cis-1,2-Dichloroethene		ND			1.0	0.20	ug/L			12/01/20 17:24	1
cis-1,3-Dichloropropene		ND			1.0	0.20	ug/L			12/01/20 17:24	1
Cyclohexane		**2.9**	**J**		5.0	1.0	ug/L			12/01/20 17:24	1
Cyclohexanone		ND			100	25	ug/L			12/01/20 17:24	1
Dibromochloromethane		ND			1.0	0.20	ug/L			12/01/20 17:24	1
Dichlorodifluoromethane		ND			1.0	0.20	ug/L			12/01/20 17:24	1
Ethyl acetate		ND			5.0	0.70	ug/L			12/01/20 17:24	1
Ethyl ether		ND			5.0	0.20	ug/L			12/01/20 17:24	1
Ethylbenzene		**2.5**			1.0	0.40	ug/L			12/01/20 17:24	1
Freon 113		ND			10	0.20	ug/L			12/01/20 17:24	1
Isobutyl alcohol		ND			250	36	ug/L			12/01/20 17:24	1
Isopropylbenzene		**0.48**	**J**		5.0	0.20	ug/L			12/01/20 17:24	1
m&p-Xylene		**4.5**	**J**		5.0	1.0	ug/L			12/01/20 17:24	1
Methyl acetate		ND			5.0	0.30	ug/L			12/01/20 17:24	1

Client Sample ID: B55-PDI-SB-05
Date Collected: 11/18/20 09:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-4
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Methylcyclohexane	**1.2**	**J**	5.0	0.50	ug/L			12/01/20 17:24	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 17:24	1
Naphthalene	**1.7**	**J**	5.0	1.0	ug/L			12/01/20 17:24	1
n-Butanol	ND		250	61	ug/L			12/01/20 17:24	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 17:24	1
o-Xylene	**1.7**		1.0	0.40	ug/L			12/01/20 17:24	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 17:24	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 17:24	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 17:24	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 17:24	1
Toluene	**0.23**	**J**	1.0	0.20	ug/L			12/01/20 17:24	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 17:24	1
Xylenes, Total	**6.2**		6.0	1.4	ug/L			12/01/20 17:24	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*5.3*	*J*	*ug/L*		*6.13*			*12/01/20 17:24*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*12/01/20 17:24*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*12/01/20 17:24*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*12/01/20 17:24*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 17:24*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
1,2,4,5-Tetrachlorobenzene	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,2'-oxybis[1-chloropropane]	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,3,4,6-Tetrachlorophenol	ND		13	5.0	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4,5-Trichlorophenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4,6-Trichlorophenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4-Dichlorophenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4-Dimethylphenol	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4-Dinitrophenol	ND		38	18	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,4-Dinitrotoluene	ND		6.3	1.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
2,6-Dinitrotoluene	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2-Chloronaphthalene	ND		1.3	0.50	ug/L		11/25/20 10:15	12/02/20 07:30	1
2-Chlorophenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2-Methylnaphthalene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
2-Methylphenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
2-Nitroaniline	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1

Client Sample ID: B55-PDI-SB-05
Lab Sample ID: 410-21427-4

Date Collected: 11/18/20 09:00
Matrix: Groundwater

Date Received: 11/19/20 11:18

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
3,3'-Dichlorobenzidine	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
3-Nitroaniline	ND		8.8	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
4,6-Dinitro-2-methylphenol	ND		26	10	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Bromophenyl-phenylether	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Chloro-3-methylphenol	ND		4.4	2.0	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Chloroaniline	ND		13	5.0	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Chlorophenyl-phenyl ether	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
3,4-Methylphenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Nitroaniline	ND		3.8	1.1	ug/L		11/25/20 10:15	12/02/20 07:30	1
4-Nitrophenol	ND		38	13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Acenaphthene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Acenaphthylene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Acetophenone	ND		13	5.0	ug/L		11/25/20 10:15	12/02/20 07:30	1
Aniline	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
Anthracene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Atrazine	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzaldehyde	ND		13	3.8	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzo[a]anthracene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzo[a]pyrene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzo[b]fluoranthene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzo[g,h,i]perylene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzo[k]fluoranthene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Benzyl alcohol	ND		38	13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Butylbenzylphthalate	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Caprolactam	ND		14	6.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
Carbazole	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Chrysene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Di-n-butyl phthalate	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Di-n-octyl phthalate	ND		14	6.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
Dibenz(a,h)anthracene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Dibenzofuran	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Dicyclohexylamine	ND	*-1 J	25	13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Diethyl phthalate	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Dimethyl phthalate	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Fluoranthene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Fluorene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Hexachlorobenzene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Hexachlorobutadiene	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Hexachlorocyclopentadiene	ND		14	6.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
Hexachloroethane	ND		6.3	1.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
Indeno[1,2,3-cd]pyrene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Isophorone	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
n,n'-Dimethylaniline	ND		1.3	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
N-Nitrosodi-n-propylamine	ND		3.8	0.88	ug/L		11/25/20 10:15	12/02/20 07:30	1
N-Nitrosodiphenylamine	ND		3.8	0.88	ug/L		11/25/20 10:15	12/02/20 07:30	1
Naphthalene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Nitrobenzene	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Pentachlorophenol	ND		6.3	1.3	ug/L		11/25/20 10:15	12/02/20 07:30	1

Client Sample ID: B55-PDI-SB-05
Lab Sample ID: 410-21427-4

Date Collected: 11/18/20 09:00
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenanthrene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Phenol	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Pyrene	ND		0.63	0.13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Pyridine	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1
Triethylamine	ND		13	13	ug/L		11/25/20 10:15	12/02/20 07:30	1
Bis(2-chloroethoxy)methane	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Bis(2-chloroethyl)ether	ND		2.5	0.63	ug/L		11/25/20 10:15	12/02/20 07:30	1
Bis(2-ethylhexyl) phthalate	ND		14	6.3	ug/L		11/25/20 10:15	12/02/20 07:30	1
1,4-Dioxane	ND		6.3	2.5	ug/L		11/25/20 10:15	12/02/20 07:30	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*5.6*	*J N*	*ug/L*		*5.45*		*11/25/20 10:15*	*12/02/20 07:30*	*1*
Unknown	*6.7*	*J N*	*ug/L*		*7.98*		*11/25/20 10:15*	*12/02/20 07:30*	*1*
2-Fluoro-6-nitrophenol	*5.4*	*J N*	*ug/L*		*8.17*	*1526-17-6*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
Unknown	*9.3*	*J N*	*ug/L*		*10.87*		*11/25/20 10:15*	*12/02/20 07:30*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*51*		*10 - 150*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
2-Fluorobiphenyl (Surr)	*59*		*44 - 102*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
2-Fluorophenol (Surr)	*24*		*10 - 84*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
Nitrobenzene-d5 (Surr)	*61*		*23 - 128*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
p-Terphenyl-d14 (Surr)	*32*		*31 - 113*	*11/25/20 10:15*	*12/02/20 07:30*	*1*
Phenol-d5 (Surr)	*22*		*10 - 67*	*11/25/20 10:15*	*12/02/20 07:30*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 20:50	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 20:50	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 20:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*93*		*39 - 153*	*11/20/20 16:15*	*11/23/20 20:50*	*1*

Client Sample ID: B55-PDI-SB-07
Lab Sample ID: 410-21427-5

Date Collected: 11/18/20 09:30
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 17:46	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 17:46	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 17:46	1
1,2,4-Trimethylbenzene	**13**		5.0	1.0	ug/L			12/01/20 17:46	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 17:46	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 17:46	1

Client Sample ID: B55-PDI-SB-07
Lab Sample ID: 410-21427-5

Date Collected: 11/18/20 09:30
Matrix: Groundwater

Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
1,3,5-Trimethylbenzene	**2.8**	**J**	5.0	0.30	ug/L			12/01/20 17:46	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 17:46	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 17:46	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 17:46	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 17:46	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 17:46	1
Acetone 20	~~1.4~~	~~J~~ UB	20	0.70	ug/L			12/01/20 17:46	1
Acetonitrile	ND		100	16	ug/L			12/01/20 17:46	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 17:46	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 17:46	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 17:46	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 17:46	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 17:46	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Cyclohexane	**4.6**	**J**	5.0	1.0	ug/L			12/01/20 17:46	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 17:46	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 17:46	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 17:46	1
Ethylbenzene	**3.1**		1.0	0.40	ug/L			12/01/20 17:46	1
Freon 113	ND		10	0.20	ug/L			12/01/20 17:46	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 17:46	1
Isopropylbenzene	**0.64**	**J**	5.0	0.20	ug/L			12/01/20 17:46	1
m&p-Xylene	**6.0**		5.0	1.0	ug/L			12/01/20 17:46	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 17:46	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Methylcyclohexane	**2.3**	**J**	5.0	0.50	ug/L			12/01/20 17:46	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 17:46	1
Naphthalene	**1.6**	**J**	5.0	1.0	ug/L			12/01/20 17:46	1
n-Butanol	ND		250	61	ug/L			12/01/20 17:46	1
n-Butylbenzene	**0.20**	**J**	5.0	0.20	ug/L			12/01/20 17:46	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 17:46	1
o-Xylene	**2.0**		1.0	0.40	ug/L			12/01/20 17:46	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 17:46	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 17:46	1

Client Sample ID: B55-PDI-SB-07

Date Collected: 11/18/20 09:30
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-5

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 17:46	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 17:46	1
Toluene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 17:46	1
Xylenes, Total	**8.0**		6.0	1.4	ug/L			12/01/20 17:46	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*7.6*	*J N*	*ug/L*		*6.13*			*12/01/20 17:46*	*1*
Benzene, 1-ethyl-3-methyl-	*5.8*	*J N*	*ug/L*		*12.53*	*620-14-4*		*12/01/20 17:46*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*12/01/20 17:46*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*12/01/20 17:46*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*12/01/20 17:46*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*12/01/20 17:46*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
1,2,4,5-Tetrachlorobenzene	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,2'-oxybis[1-chloropropane]	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,3,4,6-Tetrachlorophenol	ND		11	4.3	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4,5-Trichlorophenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4,6-Trichlorophenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4-Dichlorophenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4-Dimethylphenol	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4-Dinitrophenol	ND		32	15	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,4-Dinitrotoluene	ND		5.4	1.1	ug/L		11/25/20 10:15	12/02/20 17:38	1
2,6-Dinitrotoluene	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Chloronaphthalene	ND		1.1	0.43	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Chlorophenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Methylnaphthalene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Methylphenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Nitroaniline	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
2-Nitrophenol	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
3,3'-Dichlorobenzidine	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
3-Nitroaniline	ND		7.5	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
4,6-Dinitro-2-methylphenol	ND		23	8.6	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Bromophenyl-phenylether	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Chloro-3-methylphenol	ND		3.8	1.7	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Chloroaniline	ND		11	4.3	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Chlorophenyl-phenyl ether	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
3,4-Methylphenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Nitroaniline	ND		3.2	0.97	ug/L		11/25/20 10:15	12/02/20 17:38	1
4-Nitrophenol	ND		32	11	ug/L		11/25/20 10:15	12/02/20 17:38	1

Client Sample ID: B55-PDI-SB-07
Lab Sample ID: 410-21427-5

Date Collected: 11/18/20 09:30
Matrix: Groundwater

Date Received: 11/19/20 11:18

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Acenaphthylene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Acetophenone	ND		11	4.3	ug/L		11/25/20 10:15	12/02/20 17:38	1
Aniline	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Anthracene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Atrazine	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzaldehyde	ND		11	3.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzo[a]anthracene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzo[a]pyrene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzo[b]fluoranthene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzo[g,h,i]perylene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzo[k]fluoranthene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Benzyl alcohol	ND		32	11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Butylbenzylphthalate	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Caprolactam	ND		12	5.4	ug/L		11/25/20 10:15	12/02/20 17:38	1
Carbazole	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Chrysene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Di-n-butyl phthalate	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Di-n-octyl phthalate	ND		12	5.4	ug/L		11/25/20 10:15	12/02/20 17:38	1
Dibenz(a,h)anthracene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Dibenzofuran	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Dicyclohexylamine	ND	~~*-*1~~ J	22	11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Diethyl phthalate	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Dimethyl phthalate	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Fluoranthene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Fluorene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Hexachlorobenzene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Hexachlorobutadiene	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Hexachlorocyclopentadiene	ND		12	5.4	ug/L		11/25/20 10:15	12/02/20 17:38	1
Hexachloroethane	ND		5.4	1.1	ug/L		11/25/20 10:15	12/02/20 17:38	1
Indeno[1,2,3-cd]pyrene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Isophorone	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
n,n'-Dimethylaniline	ND		1.1	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
N-Nitrosodi-n-propylamine	ND		3.2	0.75	ug/L		11/25/20 10:15	12/02/20 17:38	1
N-Nitrosodiphenylamine	ND		3.2	0.75	ug/L		11/25/20 10:15	12/02/20 17:38	1
Naphthalene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Nitrobenzene	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Pentachlorophenol	ND		5.4	1.1	ug/L		11/25/20 10:15	12/02/20 17:38	1
Phenanthrene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Phenol	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Pyrene	ND		0.54	0.11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Pyridine	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1
Triethylamine	ND		11	11	ug/L		11/25/20 10:15	12/02/20 17:38	1
Bis(2-chloroethoxy)methane	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Bis(2-chloroethyl)ether	ND		2.2	0.54	ug/L		11/25/20 10:15	12/02/20 17:38	1
Bis(2-ethylhexyl) phthalate	ND		12	5.4	ug/L		11/25/20 10:15	12/02/20 17:38	1
1,4-Dioxane	ND		5.4	2.2	ug/L		11/25/20 10:15	12/02/20 17:38	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*14*	*J* N	*ug/L*		*5.45*		*11/25/20 10:15*	*12/02/20 17:38*	*1*

Client Sample ID: B55-PDI-SB-07
Lab Sample ID: 410-21427-5

Date Collected: 11/18/20 09:30
Matrix: Groundwater
Date Received: 11/19/20 11:18

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*10 - 150*	*11/25/20 10:15*	*12/02/20 17:38*	*1*
2-Fluorobiphenyl (Surr)	*74*		*44 - 102*	*11/25/20 10:15*	*12/02/20 17:38*	*1*
2-Fluorophenol (Surr)	*22*		*10 - 84*	*11/25/20 10:15*	*12/02/20 17:38*	*1*
Nitrobenzene-d5 (Surr)	*75*		*23 - 128*	*11/25/20 10:15*	*12/02/20 17:38*	*1*
p-Terphenyl-d14 (Surr)	*41*		*31 - 113*	*11/25/20 10:15*	*12/02/20 17:38*	*1*
Phenol-d5 (Surr)	*22*		*10 - 67*	*11/25/20 10:15*	*12/02/20 17:38*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 21:02	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 21:02	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 21:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*88*		*39 - 153*	*11/20/20 16:15*	*11/23/20 21:02*	*1*

Client Sample ID: B55-PDI-SB-15
Lab Sample ID: 410-21427-6

Date Collected: 11/18/20 10:00
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:08	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 18:08	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 18:08	1
1,2,4-Trimethylbenzene	**10**		5.0	1.0	ug/L			12/01/20 18:08	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 18:08	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:08	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
1,3,5-Trimethylbenzene	**2.2**	**J**	5.0	0.30	ug/L			12/01/20 18:08	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 18:08	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 18:08	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 18:08	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 18:08	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 18:08	1
Acetone 20	~~8.9~~	~~J~~ UB	20	0.70	ug/L			12/01/20 18:08	1
Acetonitrile	ND		100	16	ug/L			12/01/20 18:08	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 18:08	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 18:08	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 18:08	1
Carbon disulfide	**0.39**	**J**	5.0	0.20	ug/L			12/01/20 18:08	1

Client Sample ID: B55-PDI-SB-15

Date Collected: 11/18/20 10:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-6

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 18:08	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Chloroform	**0.56**	**J**	1.0	0.20	ug/L			12/01/20 18:08	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Cyclohexane	ND		5.0	1.0	ug/L			12/01/20 18:08	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 18:08	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 18:08	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 18:08	1
Ethylbenzene	**2.5**		1.0	0.40	ug/L			12/01/20 18:08	1
Freon 113	ND		10	0.20	ug/L			12/01/20 18:08	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 18:08	1
Isopropylbenzene	**0.55**	**J**	5.0	0.20	ug/L			12/01/20 18:08	1
m&p-Xylene	**4.6**	**J**	5.0	1.0	ug/L			12/01/20 18:08	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 18:08	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Methylcyclohexane	**1.7**	**J**	5.0	0.50	ug/L			12/01/20 18:08	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 18:08	1
Naphthalene	**1.3**	**J**	5.0	1.0	ug/L			12/01/20 18:08	1
n-Butanol	ND		250	61	ug/L			12/01/20 18:08	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 18:08	1
o-Xylene	**1.6**		1.0	0.40	ug/L			12/01/20 18:08	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 18:08	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 18:08	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 18:08	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 18:08	1
Toluene	**0.21**	**J**	1.0	0.20	ug/L			12/01/20 18:08	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 18:08	1
Xylenes, Total	**6.2**		6.0	1.4	ug/L			12/01/20 18:08	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 18:08*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/20 18:08*	*1*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*12/01/20 18:08*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*12/01/20 18:08*	*1*

Client Sample ID: B55-PDI-SB-15

Date Collected: 11/18/20 10:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-6

Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*12/01/20 18:08*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
1,2,4,5-Tetrachlorobenzene	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,2'-oxybis[1-chloropropane]	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,3,4,6-Tetrachlorophenol	ND		12	4.8	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4,5-Trichlorophenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4,6-Trichlorophenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4-Dichlorophenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4-Dimethylphenol	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4-Dinitrophenol	ND		36	17	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,4-Dinitrotoluene	ND		6.0	1.2	ug/L		11/25/20 10:15	12/02/20 18:06	1
2,6-Dinitrotoluene	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Chloronaphthalene	ND		1.2	0.48	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Chlorophenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Methylnaphthalene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Methylphenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Nitroaniline	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
2-Nitrophenol	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
3,3'-Dichlorobenzidine	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
3-Nitroaniline	ND		8.5	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
4,6-Dinitro-2-methylphenol	ND		25	9.7	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Bromophenyl-phenylether	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Chloro-3-methylphenol	ND		4.2	1.9	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Chloroaniline	ND		12	4.8	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Chlorophenyl-phenyl ether	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
3,4-Methylphenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Nitroaniline	ND		3.6	1.1	ug/L		11/25/20 10:15	12/02/20 18:06	1
4-Nitrophenol	ND		36	12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Acenaphthene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Acenaphthylene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Acetophenone	ND		12	4.8	ug/L		11/25/20 10:15	12/02/20 18:06	1
Aniline	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
Anthracene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Atrazine	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzaldehyde	ND		12	3.6	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzo[a]anthracene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzo[a]pyrene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzo[b]fluoranthene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzo[g,h,i]perylene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzo[k]fluoranthene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Benzyl alcohol	ND		36	12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Butylbenzylphthalate	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
Caprolactam	ND		13	6.0	ug/L		11/25/20 10:15	12/02/20 18:06	1
Carbazole	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Chrysene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Di-n-butyl phthalate	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1

Client Sample ID: B55-PDI-SB-15
Date Collected: 11/18/20 10:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-6
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Di-n-octyl phthalate	ND		13	6.0	ug/L		11/25/20 10:15	12/02/20 18:06	1
Dibenz(a,h)anthracene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Dibenzofuran	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Dicyclohexylamine	ND	*-1 J	24	12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Diethyl phthalate	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
Dimethyl phthalate	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
Fluoranthene	**0.17**	**J**	0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Fluorene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Hexachlorobenzene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Hexachlorobutadiene	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Hexachlorocyclopentadiene	ND		13	6.0	ug/L		11/25/20 10:15	12/02/20 18:06	1
Hexachloroethane	ND		6.0	1.2	ug/L		11/25/20 10:15	12/02/20 18:06	1
Indeno[1,2,3-cd]pyrene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Isophorone	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
n,n'-Dimethylaniline	ND		1.2	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
N-Nitrosodi-n-propylamine	ND		3.6	0.85	ug/L		11/25/20 10:15	12/02/20 18:06	1
N-Nitrosodiphenylamine	ND		3.6	0.85	ug/L		11/25/20 10:15	12/02/20 18:06	1
Naphthalene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Nitrobenzene	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Pentachlorophenol	ND		6.0	1.2	ug/L		11/25/20 10:15	12/02/20 18:06	1
Phenanthrene	ND		0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Phenol	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Pyrene	**0.16**	**J**	0.60	0.12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Pyridine	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1
Triethylamine	ND		12	12	ug/L		11/25/20 10:15	12/02/20 18:06	1
Bis(2-chloroethoxy)methane	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Bis(2-chloroethyl)ether	ND		2.4	0.60	ug/L		11/25/20 10:15	12/02/20 18:06	1
Bis(2-ethylhexyl) phthalate	ND		13	6.0	ug/L		11/25/20 10:15	12/02/20 18:06	1
1,4-Dioxane	ND		6.0	2.4	ug/L		11/25/20 10:15	12/02/20 18:06	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
1-Hexanol, 2-ethyl-	*6.1*	*T J N*	*ug/L*		*6.79*	*104-76-7*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
Unknown	*6.1*	*T J N*	*ug/L*		*10.15*		*11/25/20 10:15*	*12/02/20 18:06*	*1*
Unknown	*14*	*T J N*	*ug/L*		*18.69*		*11/25/20 10:15*	*12/02/20 18:06*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*85*		*10 - 150*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
2-Fluorobiphenyl (Surr)	*76*		*44 - 102*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
2-Fluorophenol (Surr)	*47*		*10 - 84*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
Nitrobenzene-d5 (Surr)	*77*		*23 - 128*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
p-Terphenyl-d14 (Surr)	*59*		*31 - 113*	*11/25/20 10:15*	*12/02/20 18:06*	*1*
Phenol-d5 (Surr)	*37*		*10 - 67*	*11/25/20 10:15*	*12/02/20 18:06*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 21:13	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 21:13	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 21:13	1

Client Sample ID: B55-PDI-SB-15
Lab Sample ID: 410-21427-6

Date Collected: 11/18/20 10:00
Matrix: Groundwater
Date Received: 11/19/20 11:18

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	89		39 - 153	11/20/20 16:15	11/23/20 21:13	1

Client Sample ID: B55-PDI-SB-16
Lab Sample ID: 410-21427-7

Date Collected: 11/18/20 10:45
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:30	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 18:30	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 18:30	1
1,2,4-Trimethylbenzene	**6.3**		5.0	1.0	ug/L			12/01/20 18:30	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 18:30	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:30	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
1,3,5-Trimethylbenzene	**1.4**	**J**	5.0	0.30	ug/L			12/01/20 18:30	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 18:30	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 18:30	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 18:30	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 18:30	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 18:30	1
Acetone	**1.9**	**J**	20	0.70	ug/L			12/01/20 18:30	1
Acetonitrile	ND		100	16	ug/L			12/01/20 18:30	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 18:30	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 18:30	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 18:30	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 18:30	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 18:30	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Cyclohexane	**1.6**	**J**	5.0	1.0	ug/L			12/01/20 18:30	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 18:30	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 18:30	1

Client Sample ID: B55-PDI-SB-16
Lab Sample ID: 410-21427-7

Date Collected: 11/18/20 10:45
Matrix: Groundwater

Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 18:30	1
Ethylbenzene	**1.5**		1.0	0.40	ug/L			12/01/20 18:30	1
Freon 113	ND		10	0.20	ug/L			12/01/20 18:30	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 18:30	1
Isopropylbenzene	**0.29**	**J**	5.0	0.20	ug/L			12/01/20 18:30	1
m&p-Xylene	**2.8**	**J**	5.0	1.0	ug/L			12/01/20 18:30	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 18:30	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Methylcyclohexane	**1.0**	**J**	5.0	0.50	ug/L			12/01/20 18:30	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 18:30	1
Naphthalene	ND		5.0	1.0	ug/L			12/01/20 18:30	1
n-Butanol	ND		250	61	ug/L			12/01/20 18:30	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 18:30	1
o-Xylene	**0.93**	**J**	1.0	0.40	ug/L			12/01/20 18:30	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 18:30	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 18:30	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 18:30	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 18:30	1
Toluene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 18:30	1
Xylenes, Total	**3.7**	**J**	6.0	1.4	ug/L			12/01/20 18:30	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 18:30*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/20 18:30*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*12/01/20 18:30*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*12/01/20 18:30*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 18:30*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
1,2,4,5-Tetrachlorobenzene	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,2'-oxybis[1-chloropropane]	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,3,4,6-Tetrachlorophenol	ND		110	42	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,4,5-Trichlorophenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,4,6-Trichlorophenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,4-Dichlorophenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,4-Dimethylphenol	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,4-Dinitrophenol	ND		320	150	ug/L		11/25/20 10:15	12/02/20 18:34	10

Client Sample ID: B55-PDI-SB-16
Date Collected: 11/18/20 10:45
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-7
Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dinitrotoluene	ND		53	11	ug/L		11/25/20 10:15	12/02/20 18:34	10
2,6-Dinitrotoluene	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Chloronaphthalene	ND		11	4.2	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Chlorophenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Methylnaphthalene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Methylphenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Nitroaniline	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
2-Nitrophenol	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
3,3'-Dichlorobenzidine	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
3-Nitroaniline	ND		74	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
4,6-Dinitro-2-methylphenol	ND		220	85	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Bromophenyl-phenylether	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Chloro-3-methylphenol	ND		37	17	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Chloroaniline	ND		110	42	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Chlorophenyl-phenyl ether	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
3,4-Methylphenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Nitroaniline	ND		32	9.6	ug/L		11/25/20 10:15	12/02/20 18:34	10
4-Nitrophenol	ND		320	110	ug/L		11/25/20 10:15	12/02/20 18:34	10
Acenaphthene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Acenaphthylene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Acetophenone	ND		110	42	ug/L		11/25/20 10:15	12/02/20 18:34	10
Aniline	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
Anthracene	**1.7**	**J**	5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Atrazine	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzaldehyde	ND		110	32	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzo[a]anthracene	**7.6**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzo[a]pyrene	**9.2**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzo[b]fluoranthene	**10**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzo[g,h,i]perylene	**5.0**	**J**	5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzo[k]fluoranthene	**4.6**	**J**	5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Benzyl alcohol	ND		320	110	ug/L		11/25/20 10:15	12/02/20 18:34	10
Butylbenzylphthalate	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Caprolactam	ND		120	53	ug/L		11/25/20 10:15	12/02/20 18:34	10
Carbazole	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Chrysene	**8.9**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Di-n-butyl phthalate	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Di-n-octyl phthalate	ND		120	53	ug/L		11/25/20 10:15	12/02/20 18:34	10
Dibenz(a,h)anthracene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Dibenzofuran	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Dicyclohexylamine	ND	~~*1~~ J	210	110	ug/L		11/25/20 10:15	12/02/20 18:34	10
Diethyl phthalate	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Dimethyl phthalate	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Fluoranthene	**13**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Fluorene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Hexachlorobenzene	ND		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Hexachlorobutadiene	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Hexachlorocyclopentadiene	ND		120	53	ug/L		11/25/20 10:15	12/02/20 18:34	10
Hexachloroethane	ND		53	11	ug/L		11/25/20 10:15	12/02/20 18:34	10
Indeno[1,2,3-cd]pyrene	**5.0**	**J**	5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10

Client Sample ID: B55-PDI-SB-16
Lab Sample ID: 410-21427-7
Date Collected: 11/18/20 10:45
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isophorone	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
n,n'-Dimethylaniline	ND		11	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
N-Nitrosodi-n-propylamine	ND		32	7.4	ug/L		11/25/20 10:15	12/02/20 18:34	10
N-Nitrosodiphenylamine	ND		32	7.4	ug/L		11/25/20 10:15	12/02/20 18:34	10
Naphthalene	**1.4**	**J**	5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Nitrobenzene	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Pentachlorophenol	ND		53	11	ug/L		11/25/20 10:15	12/02/20 18:34	10
Phenanthrene	**7.1**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Phenol	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Pyrene	**15**		5.3	1.1	ug/L		11/25/20 10:15	12/02/20 18:34	10
Pyridine	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10
Triethylamine	ND		110	110	ug/L		11/25/20 10:15	12/02/20 18:34	10
Bis(2-chloroethoxy)methane	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Bis(2-chloroethyl)ether	ND		21	5.3	ug/L		11/25/20 10:15	12/02/20 18:34	10
Bis(2-ethylhexyl) phthalate	**56**	**J**	120	53	ug/L		11/25/20 10:15	12/02/20 18:34	10
1,4-Dioxane	ND		53	21	ug/L		11/25/20 10:15	12/02/20 18:34	10

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*11/25/20 10:15*	*12/02/20 18:34*	*10*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*67*		*10 - 150*	*11/25/20 10:15*	*12/02/20 18:34*	*10*
2-Fluorobiphenyl (Surr)	*93*		*44 - 102*	*11/25/20 10:15*	*12/02/20 18:34*	*10*
2-Fluorophenol (Surr)	*45*		*10 - 84*	*11/25/20 10:15*	*12/02/20 18:34*	*10*
Nitrobenzene-d5 (Surr)	*88*		*23 - 128*	*11/25/20 10:15*	*12/02/20 18:34*	*10*
p-Terphenyl-d14 (Surr)	*63*		*31 - 113*	*11/25/20 10:15*	*12/02/20 18:34*	*10*
Phenol-d5 (Surr)	*37*		*10 - 67*	*11/25/20 10:15*	*12/02/20 18:34*	*10*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 21:24	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 21:24	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 21:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*94*		*39 - 153*	*11/20/20 16:15*	*11/23/20 21:24*	*1*

Client Sample ID: B55-PDI-SB-18
Lab Sample ID: 410-21427-8
Date Collected: 11/18/20 12:00
Matrix: Groundwater
Date Received: 11/19/20 11:18

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:52	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 18:52	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 18:52	1
1,2,4-Trimethylbenzene	**7.1**		5.0	1.0	ug/L			12/01/20 18:52	1

Client Sample ID: B55-PDI-SB-18
Date Collected: 11/18/20 12:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-8
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 18:52	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:52	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 18:52	1
1,2-Dichloropropane	**0.47**	**J**	1.0	0.20	ug/L			12/01/20 18:52	1
1,3,5-Trimethylbenzene	**4.4**	**J**	5.0	0.30	ug/L			12/01/20 18:52	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:52	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 18:52	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 18:52	1
2-Butanone	**11**		10	0.30	ug/L			12/01/20 18:52	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 18:52	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 18:52	1
4-Methyl-2-pentanone	**0.52**	**J**	10	0.50	ug/L			12/01/20 18:52	1
Acetone	**18**	**J**	20	0.70	ug/L			12/01/20 18:52	1
Acetonitrile	ND		100	16	ug/L			12/01/20 18:52	1
Benzene	**0.51**	**J**	1.0	0.20	ug/L			12/01/20 18:52	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 18:52	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 18:52	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 18:52	1
Carbon disulfide	**0.34**	**J**	5.0	0.20	ug/L			12/01/20 18:52	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 18:52	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Cyclohexane	**13**		5.0	1.0	ug/L			12/01/20 18:52	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 18:52	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 18:52	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 18:52	1
Ethylbenzene	**5.4**		1.0	0.40	ug/L			12/01/20 18:52	1
Freon 113	ND		10	0.20	ug/L			12/01/20 18:52	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 18:52	1
Isopropylbenzene	**2.2**	**J**	5.0	0.20	ug/L			12/01/20 18:52	1
m&p-Xylene	**7.8**		5.0	1.0	ug/L			12/01/20 18:52	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 18:52	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Methylcyclohexane	**26**		5.0	0.50	ug/L			12/01/20 18:52	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 18:52	1
Naphthalene	**2.6**	**J**	5.0	1.0	ug/L			12/01/20 18:52	1
n-Butanol	ND		250	61	ug/L			12/01/20 18:52	1
n-Butylbenzene	**2.0**	**J**	5.0	0.20	ug/L			12/01/20 18:52	1
n-Heptane	**9.6**		5.0	2.0	ug/L			12/01/20 18:52	1
o-Xylene	**3.4**		1.0	0.40	ug/L			12/01/20 18:52	1

Client Sample ID: B55-PDI-SB-18
Date Collected: 11/18/20 12:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-8
Matrix: Groundwater

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
p-Isopropyltoluene	**0.58**	**J**	5.0	0.20	ug/L			12/01/20 18:52	1
sec-Butylbenzene	**1.1**	**J**	5.0	0.20	ug/L			12/01/20 18:52	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 18:52	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 18:52	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 18:52	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 18:52	1
Toluene	**0.51**	**J**	1.0	0.20	ug/L			12/01/20 18:52	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 18:52	1
Xylenes, Total	**11**		6.0	1.4	ug/L			12/01/20 18:52	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Pentane, 3-methyl-	*29*	*T J N*	*ug/L*		*4.81*	*96-14-0*		*12/01/20 18:52*	*1*
Hexane, 2-methyl-	*12*	*T J N*	*ug/L*		*7.02*	*591-76-4*		*12/01/20 18:52*	*1*
Hexane, 3-methyl-	*13*	*T J N*	*ug/L*		*7.27*	*589-34-4*		*12/01/20 18:52*	*1*
Cyclopentane, 1,3-dimethyl-, cis-	*9.7*	*T J N*	*ug/L*		*7.59*	*2532-58-3*		*12/01/20 18:52*	*1*
Benzene, 1-ethyl-2-methyl-	*11*	*T J N*	*ug/L*		*12.75*	*611-14-3*		*12/01/20 18:52*	*1*
Benzene, 1-ethyl-2,4-dimethyl-	*19*	*T J N*	*ug/L*		*13.65*	*874-41-9*		*12/01/20 18:52*	*1*
Indan, 1-methyl-	*14*	*T J N*	*ug/L*		*13.75*	*767-58-8*		*12/01/20 18:52*	*1*
Benzene, 1,2,3,4-tetramethyl-	*12*	*T J N*	*ug/L*		*13.93*	*488-23-3*		*12/01/20 18:52*	*1*
1H-Indene, 2,3-dihydro-5-methyl-	*14*	*T J N*	*ug/L*		*14.17*	*874-35-1*		*12/01/20 18:52*	*1*
Benzene, 2-ethenyl-1,4-dimethyl-	*23*	*T J N*	*ug/L*		*14.27*	*2039-89-6*		*12/01/20 18:52*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*12/01/20 18:52*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*12/01/20 18:52*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*12/01/20 18:52*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/20 18:52*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
1,2,4,5-Tetrachlorobenzene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,2'-oxybis[1-chloropropane]	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,3,4,6-Tetrachlorophenol	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4,5-Trichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4,6-Trichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4-Dichlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4-Dimethylphenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4-Dinitrophenol	ND		31	14	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,4-Dinitrotoluene	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 19:02	1
2,6-Dinitrotoluene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2-Chloronaphthalene	ND		1.0	0.41	ug/L		11/25/20 10:15	12/02/20 19:02	1
2-Chlorophenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
2-Methylnaphthalene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
2-Methylphenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1

Client Sample ID: B55-PDI-SB-18
Lab Sample ID: 410-21427-8

Date Collected: 11/18/20 12:00
Matrix: Groundwater

Date Received: 11/19/20 11:18

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitroaniline	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
2-Nitrophenol	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
3,3'-Dichlorobenzidine	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
3-Nitroaniline	ND		7.2	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
4,6-Dinitro-2-methylphenol	ND		22	8.2	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Bromophenyl-phenylether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Chloro-3-methylphenol	ND		3.6	1.6	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Chloroaniline	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Chlorophenyl-phenyl ether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
3,4-Methylphenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Nitroaniline	ND		3.1	0.93	ug/L		11/25/20 10:15	12/02/20 19:02	1
4-Nitrophenol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Acenaphthene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Acenaphthylene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Acetophenone	ND		10	4.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Aniline	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Anthracene	**0.23**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Atrazine	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzaldehyde	ND		10	3.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzo[a]anthracene	**0.20**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzo[a]pyrene	**0.21**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzo[b]fluoranthene	**0.20**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzo[g,h,i]perylene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzo[k]fluoranthene	**0.13**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Benzyl alcohol	ND		31	10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Butylbenzylphthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Caprolactam	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 19:02	1
Carbazole	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Chrysene	**0.27**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Di-n-butyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Di-n-octyl phthalate	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 19:02	1
Dibenz(a,h)anthracene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Dibenzofuran	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Dicyclohexylamine	ND	~~*-1~~ J	21	10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Diethyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Dimethyl phthalate	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Fluoranthene	**0.53**		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Fluorene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Hexachlorobenzene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Hexachlorobutadiene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Hexachlorocyclopentadiene	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 19:02	1
Hexachloroethane	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 19:02	1
Indeno[1,2,3-cd]pyrene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Isophorone	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
n,n'-Dimethylaniline	ND		1.0	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
N-Nitrosodi-n-propylamine	ND		3.1	0.72	ug/L		11/25/20 10:15	12/02/20 19:02	1
N-Nitrosodiphenylamine	ND		3.1	0.72	ug/L		11/25/20 10:15	12/02/20 19:02	1
Naphthalene	ND		0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Nitrobenzene	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1

Client Sample ID: B55-PDI-SB-18

Date Collected: 11/18/20 12:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-8

Matrix: Groundwater

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	ND		5.2	1.0	ug/L		11/25/20 10:15	12/02/20 19:02	1
Phenanthrene	**0.24**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Phenol	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Pyrene	**0.46**	**J**	0.52	0.10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Pyridine	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1
Triethylamine	ND		10	10	ug/L		11/25/20 10:15	12/02/20 19:02	1
Bis(2-chloroethoxy)methane	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Bis(2-chloroethyl)ether	ND		2.1	0.52	ug/L		11/25/20 10:15	12/02/20 19:02	1
Bis(2-ethylhexyl) phthalate	ND		11	5.2	ug/L		11/25/20 10:15	12/02/20 19:02	1
1,4-Dioxane	ND		5.2	2.1	ug/L		11/25/20 10:15	12/02/20 19:02	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Octadecane	*4.9*	*T J N*	*ug/L*		*16.66*	*593-45-3*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
Docosane	*10*	*T J N*	*ug/L*		*17.85*	*629-97-0*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
Octacosane	*9.8*	*T J N*	*ug/L*		*18.44*	*630-02-4*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
Hexatriacontane	*4.9*	*T J N*	*ug/L*		*20.12*	*630-06-8*	*11/25/20 10:15*	*12/02/20 19:02*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*77*		*10 - 150*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
2-Fluorobiphenyl (Surr)	*76*		*44 - 102*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
2-Fluorophenol (Surr)	*48*		*10 - 84*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
Nitrobenzene-d5 (Surr)	*77*		*23 - 128*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
p-Terphenyl-d14 (Surr)	*60*		*31 - 113*	*11/25/20 10:15*	*12/02/20 19:02*	*1*
Phenol-d5 (Surr)	*37*		*10 - 67*	*11/25/20 10:15*	*12/02/20 19:02*	*1*

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		60	30	ug/L		11/20/20 16:15	11/23/20 21:36	1
Formaldehyde	ND		50	20	ug/L		11/20/20 16:15	11/23/20 21:36	1
Glutaraldehyde	ND		50	30	ug/L		11/20/20 16:15	11/23/20 21:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*94*		*39 - 153*	*11/20/20 16:15*	*11/23/20 21:36*	*1*

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Date Collected: 11/18/20 12:10
Date Received: 11/19/20 11:18

Date Collected is 11/17/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9

Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**18.2**		1.0	1.0	%			11/20/20 00:15	1

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Date Collected: 11/18/20 12:10
Date Received: 11/19/20 11:18

Date Collected is 11/17/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9

Matrix: Soil

Percent Solids: 81.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,1,2,2-Tetrachloroethane	ND		0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,1,2-Trichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Date Collected: 11/18/20 12:10 Date Collected is 11/17/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9

Matrix: Soil
Percent Solids: 81.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,1-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2,3-Trichlorobenzene	ND		0.0092	0.0046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2,4-Trichlorobenzene	ND		0.0092	0.0046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2,4-Trimethylbenzene	ND	F1 J	0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2-Dibromo-3-Chloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2-Dibromoethane	ND		0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2-Dichlorobenzene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2-Dichloroethane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,2-Dichloropropane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,3,5-Trimethylbenzene	ND	F1 J	0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,3-Dichlorobenzene	ND	F1 J	0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,4-Dichlorobenzene	ND	F1 J	0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
1,4-Dioxane	ND		0.23	0.034	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
2-Butanone	**0.0020**	**J**	0.0092	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
2-Hexanone	ND		0.0092	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
2-Nitropropane	ND		0.0092	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
4-Methyl-2-pentanone	ND		0.0092	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Acetone	**0.028**	**F1 J**	0.018	0.0055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Acetonitrile	ND		0.092	0.023	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Benzene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Bromochloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Bromodichloromethane	ND		0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Bromoform	ND		0.0092	0.0046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Bromomethane	ND		0.0046	0.00064	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Carbon disulfide	**0.00070**	**J**	0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Carbon tetrachloride	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Chlorobenzene	ND	F1 J	0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Chlorodifluoromethane	ND	F1 J	0.0092	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Chloroethane	ND		0.0046	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Chloroform	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Chloromethane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
cis-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
cis-1,3-Dichloropropene	ND		0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Cyclohexane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Cyclohexanone	ND		0.23	0.023	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Dibromochloromethane	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Dichlorodifluoromethane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Ethyl acetate	ND		0.0046	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Ethyl ether	ND		0.0046	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Ethylbenzene	ND	F1 J	0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Freon 113	ND		0.0092	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Isobutyl alcohol	ND		0.23	0.035	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Isopropylbenzene	ND	F1 J	0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
m&p-Xylene	ND	F1 J	0.0046	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Methyl acetate	ND		0.0046	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Methyl tertiary butyl ether	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Methylcyclohexane	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Methylene Chloride	ND		0.0046	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Date Collected: 11/18/20 12:10 Date Collected is 11/17/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9

Matrix: Soil
Percent Solids: 81.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.0046	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
n-Butanol	ND		0.23	0.051	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
n-Butylbenzene	ND	~~F1~~ J	0.0073	0.0027	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
n-Heptane	ND		0.0073	0.0027	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
o-Xylene	ND	F1 J	0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
p-Isopropyltoluene	ND	F1 J	0.0046	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
sec-Butylbenzene	ND	F1 J	0.0046	0.0018	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Styrene	ND	F1 J	0.0046	0.00037	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
t-Butyl alcohol	ND		0.092	0.014	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
tert-Butylbenzene	ND	~~F1~~ J	0.0046	0.00073	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Tetrachloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Tetrahydrofuran	ND		0.0073	0.00092	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Toluene	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
trans-1,2-Dichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
trans-1,3-Dichloropropene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Trichloroethene	ND		0.0046	0.00046	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Trichlorofluoromethane	ND		0.0046	0.00064	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Vinyl chloride	ND		0.0046	0.00055	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1
Xylenes, Total	ND	~~F1~~ J	0.0092	0.0013	mg/Kg	☼	11/19/20 22:08	11/24/20 18:10	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*0.010*	*T J N*	*mg/Kg*	☼	*11.17*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
Unknown	*0.0087*	*T J N*	*mg/Kg*	☼	*11.23*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
Dodecane, 4-methyl-	*0.012*	*T J N*	*mg/Kg*	☼	*11.50*	*6117-97-1*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
Unknown	*0.0094*	*T J N*	*mg/Kg*	☼	*11.56*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
1-Tetradecene	*0.0093*	*T J N*	*mg/Kg*	☼	*11.58*	*1120-36-1*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
Unknown	*0.0084*	*T J N*	*mg/Kg*	☼	*11.63*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
Trifluoroacetic acid, n-heptadecyl ester	*0.015*	*T J N*	*mg/Kg*	☼	*11.74*	*1000216-79-2*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
Unknown	*0.0097*	*T J N*	*mg/Kg*	☼	*11.87*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
Unknown	*0.013*	*T J N*	*mg/Kg*	☼	*12.05*		*11/19/20 22:08*	*11/24/20 18:10*	*1*
1-Decanol, 2-hexyl-	*0.011*	*T J N*	*mg/Kg*	☼	*12.10*	*2425-77-6*	*11/19/20 22:08*	*11/24/20 18:10*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*54 - 135*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
4-Bromofluorobenzene (Surr)	*95*		*50 - 131*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
Dibromofluoromethane (Surr)	*99*		*50 - 141*	*11/19/20 22:08*	*11/24/20 18:10*	*1*
Toluene-d8 (Surr)	*102*		*52 - 141*	*11/19/20 22:08*	*11/24/20 18:10*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
1,2,4,5-Tetrachlorobenzene	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,2'-oxybis[1-chloropropane]	ND		0.053	0.024	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,3,4,6-Tetrachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4,5-Trichlorophenol	ND		0.081	0.037	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4,6-Trichlorophenol	ND		0.069	0.033	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4-Dichlorophenol	ND		0.053	0.024	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4-Dimethylphenol	ND	~~F1~~ J	0.081	0.037	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,4-Dinitrophenol	ND	~~F1 F2~~ J	1.2	0.41	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Lab Sample ID: 410-21427-9

Date Collected: 11/18/20 12:10 Date Collected is 11/17/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 81.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dinitrotoluene	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2,6-Dinitrotoluene	ND		0.061	0.028	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Chloronaphthalene	ND		0.041	0.0081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Chlorophenol	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Methylnaphthalene	**0.0042**	**J**	0.041	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Methylphenol	ND		0.081	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Nitroaniline	ND		0.061	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
2-Nitrophenol	ND	~~F1 F2~~ J	0.069	0.033	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
3,3'-Dichlorobenzidine	ND	F1 F2 J	0.41	0.12	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
3-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4,6-Dinitro-2-methylphenol	ND	~~F1 F2~~ J	0.61	0.28	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Bromophenyl-phenylether	ND		0.061	0.028	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Chloro-3-methylphenol	ND		0.061	0.028	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
3,4-Methylphenol	ND		0.061	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Nitroaniline	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Nitrophenol	ND		0.61	0.20	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Acenaphthene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Acenaphthylene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Acetophenone	ND		0.061	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Anthracene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Atrazine	ND		0.53	0.24	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzaldehyde	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzo[a]anthracene	ND		0.020	0.0081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzo[a]pyrene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzo[b]fluoranthene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzo[g,h,i]perylene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzo[k]fluoranthene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Bis(2-chloroethoxy)methane	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Bis(2-chloroethyl)ether	ND		0.061	0.028	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Bis(2-ethylhexyl) phthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Butylbenzylphthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Caprolactam	ND	~~F1~~ J	0.20	0.041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Carbazole	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Chrysene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Di-n-butyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Di-n-octyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Dibenz(a,h)anthracene	ND		0.020	0.0081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Dibenzofuran	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Diethyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Dimethyl phthalate	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Fluoranthene	**0.0089**	**J**	0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Chloroaniline	ND		0.20	0.041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Fluorene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
4-Chlorophenyl-phenyl ether	ND		0.053	0.024	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Hexachlorobenzene	ND		0.020	0.0081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Hexachlorobutadiene	ND		0.094	0.045	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Hexachlorocyclopentadiene	~~ND~~	~~F1~~ R	0.61	0.24	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Hexachloroethane	ND	F1 F2 J	0.20	0.041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)

Date Collected: 11/18/20 12:10
Date Received: 11/19/20 11:18

Date Collected is 11/17/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-9

Matrix: Soil
Percent Solids: 81.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isophorone	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
N-Nitrosodi-n-propylamine	ND		0.061	0.028	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
N-Nitrosodiphenylamine	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Naphthalene	ND		0.020	0.0081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Nitrobenzene	ND		0.081	0.033	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Phenanthrene	ND		0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Aniline	ND		0.61	0.20	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Phenol	ND		0.045	0.020	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Pyrene	**0.011**	J	0.020	0.0041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Pentachlorophenol	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Benzyl alcohol	ND		0.61	0.20	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
n,n'-Dimethylaniline	ND		0.20	0.041	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Pyridine	ND		0.20	0.081	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
Triethylamine	ND	*-*1 J	6.1	2.0	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1
1,4-Dioxane	ND		0.41	0.12	mg/Kg	☼	11/21/20 07:13	11/25/20 20:49	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Furan, 2,5-dimethyl-	*0.17*	*T B J N R*	*mg/Kg*	☼	*2.27*	*625-86-5*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*1.5*	*T B J R*	*mg/Kg*	☼	*3.89*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
2-Cyclohexen-1-one	*0.58*	*T J N*	*mg/Kg*	☼	*4.81*	*930-68-7*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Cyclohexane, isothiocyanato-	*0.31*	*T J N*	*mg/Kg*	☼	*7.05*	*1122-82-3*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*0.37*	*T J N*	*mg/Kg*	☼	*8.28*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Cyclohexanamine, N-cyclohexyl-N-methyl-	*0.36*	*T J N*	*mg/Kg*	☼	*8.59*	*7560-83-0*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*0.31*	*T J N*	*mg/Kg*	☼	*8.79*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*0.27*	*T J N*	*mg/Kg*	☼	*8.85*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*1.1*	*T J N*	*mg/Kg*	☼	*8.90*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*0.42*	*T J N*	*mg/Kg*	☼	*9.39*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Unknown	*0.28*	*T J N*	*mg/Kg*	☼	*10.07*		*11/21/20 07:13*	*11/25/20 20:49*	*1*
Cyclic octaatomic sulfur	*0.78*	*T J N*	*mg/Kg*	☼	*11.15*	*10544-50-0*	*11/21/20 07:13*	*11/25/20 20:49*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*102*		*45 - 108*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Nitrobenzene-d5 (Surr)	*72*		*32 - 97*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
2-Fluorophenol (Surr)	*86*		*26 - 96*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
2-Fluorobiphenyl (Surr)	*79*		*39 - 100*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
2,4,6-Tribromophenol (Surr)	*83*		*13 - 121*	*11/21/20 07:13*	*11/25/20 20:49*	*1*
Phenol-d5 (Surr)	*93*		*27 - 104*	*11/21/20 07:13*	*11/25/20 20:49*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**24**	D	12	4.1	mg/Kg	☼	11/21/20 07:13	12/03/20 11:59	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*89*		*45 - 108*	*11/21/20 07:13*	*12/03/20 11:59*	*5*
Nitrobenzene-d5 (Surr)	*65*		*32 - 97*	*11/21/20 07:13*	*12/03/20 11:59*	*5*
2-Fluorophenol (Surr)	*75*		*26 - 96*	*11/21/20 07:13*	*12/03/20 11:59*	*5*
2-Fluorobiphenyl (Surr)	*75*		*39 - 100*	*11/21/20 07:13*	*12/03/20 11:59*	*5*
2,4,6-Tribromophenol (Surr)	*70*		*13 - 121*	*11/21/20 07:13*	*12/03/20 11:59*	*5*
Phenol-d5 (Surr)	*78*		*27 - 104*	*11/21/20 07:13*	*12/03/20 11:59*	*5*

Client Sample ID: B55-PDI-SB-22 (5.2-6.2)
Lab Sample ID: 410-21427-9

Date Collected: 11/18/20 12:10 Date Collected is 11/17/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Percent Solids: 81.8

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.061	0.031	mg/Kg	☼	11/22/20 09:12	11/24/20 01:25	1
Formaldehyde	**0.11**		0.092	0.031	mg/Kg	☼	11/22/20 09:12	11/24/20 01:25	1
Glutaraldehyde	ND		0.061	0.031	mg/Kg	☼	11/22/20 09:12	11/24/20 01:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*101*		*77 - 133*	*11/22/20 09:12*	*11/24/20 01:25*	*1*

Client Sample ID: B55-PDI-SB-10 (9-10)
Lab Sample ID: 410-21427-10

Date Collected: 11/18/20 12:30 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date
Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**21.5**		1.0	1.0	%			11/20/20 00:15	1

Client Sample ID: B55-PDI-SB-10 (9-10)
Lab Sample ID: 410-21427-10

Date Collected: 11/18/20 12:30 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Percent Solids: 78.5

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
trans-1,3-Dichloropropene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Ethylbenzene	**0.68**	J	0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Styrene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,4-Dichlorobenzene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2-Dibromoethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2-Dichloroethane	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
4-Methyl-2-pentanone	ND		0.61	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Toluene	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Chlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Cyclohexane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2,4-Trichlorobenzene	ND		0.61	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,4-Dioxane	ND		15	2.3	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Dibromochloromethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Tetrachloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
cis-1,2-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
trans-1,2-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Methyl tertiary butyl ether	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
m&p-Xylene	**1.0**	J	0.30	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,3,5-Trimethylbenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,3-Dichlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Carbon tetrachloride	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
2-Hexanone	ND		0.61	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Acetone	ND		1.2	0.37	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Chloroform	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Benzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,1,1-Trichloroethane	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Bromomethane	ND		0.30	0.043	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Chloromethane	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Bromochloromethane	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50

Client Sample ID: B55-PDI-SB-10 (9-10)
Lab Sample ID: 410-21427-10
Date Collected: 11/18/20 12:30 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Percent Solids: 78.5

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		0.30	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Vinyl chloride	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Methylene Chloride	ND		0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Carbon disulfide	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Bromoform	ND	*	0.61	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Bromodichloromethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,1-Dichloroethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,1-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Trichlorofluoromethane	ND		0.30	0.043	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Dichlorodifluoromethane	ND		0.30	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Freon 113	ND		0.61	0.037	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2-Dichloropropane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
2-Butanone	ND		0.61	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,1,2-Trichloroethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
2-Nitropropane	ND	* R	0.61	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Trichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Methyl acetate	ND		0.30	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,1,2,2-Tetrachloroethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2,3-Trichlorobenzene	ND		0.61	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
o-Xylene	**0.14**	**J**	0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2-Dichlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
1,2-Dibromo-3-Chloropropane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Acetonitrile	ND		6.1	1.5	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Isopropylbenzene	**2.3**	J	0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Chlorodifluoromethane	ND		0.61	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Cyclohexanone	ND		15	1.5	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Ethyl acetate	ND		0.30	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Ethyl ether	ND		0.30	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Isobutyl alcohol	ND		15	2.3	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Naphthalene	**0.26**	**J**	0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
n-Butanol	ND		15	3.4	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
n-Butylbenzene	**10**	J	0.49	0.18	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
n-Heptane	**6.1**	J	0.49	0.18	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
p-Isopropyltoluene	**2.1**	J	0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
sec-Butylbenzene	**3.6**	J	0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
t-Butyl alcohol	ND		6.1	0.91	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
tert-Butylbenzene	**0.090**	**J**	0.30	0.049	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Tetrahydrofuran	ND		0.49	0.061	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50
Xylenes, Total	**1.1**	J	0.61	0.085	mg/Kg	☼	11/19/20 23:03	11/25/20 02:26	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Pentane, 3-methyl-	*24*	*T J N*	*mg/Kg*	☼	*4.86*	*96-14-0*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Pentane, 2,3-dimethyl-	*17*	*T J N*	*mg/Kg*	☼	*7.20*	*565-59-3*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Hexane, 3-methyl-	*28*	*T J N*	*mg/Kg*	☼	*7.32*	*589-34-4*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Heptane, 3-methyl-	*31*	*T J N*	*mg/Kg*	☼	*9.64*	*589-81-1*	*11/19/20 23:03*	*11/25/20 02:26*	*50*
Unknown	*16*	*T J N*	*mg/Kg*	☼	*10.13*		*11/19/20 23:03*	*11/25/20 02:26*	*50*
Unknown	*16*	*T J N*	*mg/Kg*	☼	*10.39*		*11/19/20 23:03*	*11/25/20 02:26*	*50*
Unknown	*27*	*T J N*	*mg/Kg*	☼	*11.12*		*11/19/20 23:03*	*11/25/20 02:26*	*50*
Unknown	*20*	*T J N*	*mg/Kg*	☼	*11.23*		*11/19/20 23:03*	*11/25/20 02:26*	*50*
Benzene, 4-ethyl-1,2-dimethyl-	*21*	*T J N*	*mg/Kg*	☼	*13.68*	*934-80-5*	*11/19/20 23:03*	*11/25/20 02:26*	*50*

Client Sample ID: B55-PDI-SB-10 (9-10)
Lab Sample ID: 410-21427-10

Date Collected: 11/18/20 12:30 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 78.5

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Benzene, 2-ethenyl-1,4-dimethyl-	18	J N	mg/Kg	☼	14.30	2039-89-6	11/19/20 23:03	11/25/20 02:26	50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		54 - 135	11/19/20 23:03	11/25/20 02:26	50
4-Bromofluorobenzene (Surr)	153	X	50 - 131	11/19/20 23:03	11/25/20 02:26	50
Dibromofluoromethane (Surr)	96		50 - 141	11/19/20 23:03	11/25/20 02:26	50
Toluene-d8 (Surr)	120		52 - 141	11/19/20 23:03	11/25/20 02:26	50

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	**58**	D	3.0	0.37	mg/Kg	☼	11/19/20 23:03	11/25/20 02:47	500
1,2,4-Trimethylbenzene	**47**	D	3.0	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 02:47	500

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		54 - 135	11/19/20 23:03	11/25/20 02:47	500
4-Bromofluorobenzene (Surr)	150	X	50 - 131	11/19/20 23:03	11/25/20 02:47	500
Dibromofluoromethane (Surr)	93		50 - 141	11/19/20 23:03	11/25/20 02:47	500
Toluene-d8 (Surr)	116		52 - 141	11/19/20 23:03	11/25/20 02:47	500

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	**0.053**		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
1,2,4,5-Tetrachlorobenzene	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,2'-oxybis[1-chloropropane]	ND		0.055	0.025	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4,5-Trichlorophenol	ND		0.085	0.038	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4,6-Trichlorophenol	ND		0.072	0.034	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4-Dichlorophenol	ND		0.055	0.025	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4-Dimethylphenol	ND		0.085	0.038	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4-Dinitrophenol	ND		1.3	0.42	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,4-Dinitrotoluene	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2,6-Dinitrotoluene	ND		0.064	0.030	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Chloronaphthalene	ND		0.042	0.0085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Chlorophenol	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Methylnaphthalene	ND		0.042	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Methylphenol	ND		0.085	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Nitroaniline	ND		0.064	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
2-Nitrophenol	ND		0.072	0.034	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
3,3'-Dichlorobenzidine	ND		0.42	0.13	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
3-Nitroaniline	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4,6-Dinitro-2-methylphenol	ND		0.64	0.30	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Bromophenyl-phenylether	ND		0.064	0.030	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Chloro-3-methylphenol	ND		0.064	0.030	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
3,4-Methylphenol	ND		0.064	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Nitroaniline	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Nitrophenol	ND		0.64	0.21	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Acenaphthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Acenaphthylene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Acetophenone	ND		0.064	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Anthracene	**0.018**	J	0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1

Client Sample ID: B55-PDI-SB-10 (9-10) — **Lab Sample ID: 410-21427-10**
Date Collected: 11/18/20 12:30 — **Matrix: Soil**
Date Received: 11/19/20 11:18 — **Percent Solids: 78.5**

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Atrazine	ND		0.55	0.25	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzaldehyde	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzo[a]anthracene	ND		0.021	0.0085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzo[a]pyrene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzo[b]fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzo[g,h,i]perylene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzo[k]fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Bis(2-chloroethoxy)methane	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Bis(2-chloroethyl)ether	ND		0.064	0.030	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Bis(2-ethylhexyl) phthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Butylbenzylphthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Caprolactam	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Carbazole	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Chrysene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Di-n-butyl phthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Di-n-octyl phthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Dibenz(a,h)anthracene	ND		0.021	0.0085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Dibenzofuran	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Diethyl phthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Dimethyl phthalate	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Chloroaniline	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Fluorene	**0.036**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
4-Chlorophenyl-phenyl ether	ND		0.055	0.025	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Hexachlorobenzene	ND		0.021	0.0085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Hexachlorobutadiene	ND		0.098	0.047	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Hexachlorocyclopentadiene	ND		0.64	0.25	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Hexachloroethane	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Isophorone	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
N-Nitrosodi-n-propylamine	ND		0.064	0.030	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
N-Nitrosodiphenylamine	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Naphthalene	ND		0.021	0.0085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Nitrobenzene	ND		0.085	0.034	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Phenanthrene	**0.084**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Aniline	ND		0.64	0.21	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Phenol	ND		0.047	0.021	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Pyrene	**0.025**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Pentachlorophenol	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Benzyl alcohol	ND		0.64	0.21	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
n,n'-Dimethylaniline	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Pyridine	ND		0.21	0.085	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
Triethylamine	ND	~~*-*1~~ J	6.4	2.1	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1
1,4-Dioxane	ND		0.42	0.13	mg/Kg	☼	11/21/20 07:13	11/25/20 20:01	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Benzene, 1,2-diethyl-	*11*	*T J N*	*mg/Kg*	☼	*5.78*	*135-01-3*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Unknown	*19*	*T J* N	*mg/Kg*	☼	*5.85*		*11/21/20 07:13*	*11/25/20 20:01*	*1*
Benzene, 1-methyl-2-propyl-	*13*	*T J N*	*mg/Kg*	☼	*5.92*	*1074-17-5*	*11/21/20 07:13*	*11/25/20 20:01*	*1*
Benzene, 4-ethyl-1,2-dimethyl-	*10*	*T J N*	*mg/Kg*	☼	*5.99*	*934-80-5*	*11/21/20 07:13*	*11/25/20 20:01*	*1*

Client Sample ID: B55-PDI-SB-10 (9-10)

Date Collected: 11/18/20 12:30 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-10

Matrix: Soil
Percent Solids: 78.5

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	11	T J N	mg/Kg	☼	6.23		11/21/20 07:13	11/25/20 20:01	1
Benzene, 1,2,4,5-tetramethyl-	13	T J N	mg/Kg	☼	6.28	95-93-2	11/21/20 07:13	11/25/20 20:01	1
Unknown	19	T J N	mg/Kg	☼	6.31		11/21/20 07:13	11/25/20 20:01	1
Benzene, 1,3-diethyl-5-methyl-	9.7	T J N	mg/Kg	☼	6.43	2050-24-0	11/21/20 07:13	11/25/20 20:01	1
1-Phenyl-1-butene	11	T J N	mg/Kg	☼	6.45	824-90-8	11/21/20 07:13	11/25/20 20:01	1
Unknown	34	T J N	mg/Kg	☼	6.52		11/21/20 07:13	11/25/20 20:01	1
Unknown	20	T J N	mg/Kg	☼	6.57		11/21/20 07:13	11/25/20 20:01	1
Benzene, diethylmethyl-	20	T J N	mg/Kg	☼	6.61	25550-13-4	11/21/20 07:13	11/25/20 20:01	1
Benzene, 1-methyl-4-(1-methylpropyl)-	12	T J N	mg/Kg	☼	6.66	1595-16-0	11/21/20 07:13	11/25/20 20:01	1
Benzene, (1-methyl-1-butenyl)-	11	T J N	mg/Kg	☼	6.74	53172-84-2	11/21/20 07:13	11/25/20 20:01	1
Unknown	36	T J N	mg/Kg	☼	6.80		11/21/20 07:13	11/25/20 20:01	1
Benzene, ethyl-1,2,4-trimethyl-	14	T J N	mg/Kg	☼	6.87	54120-62-6	11/21/20 07:13	11/25/20 20:01	1
Unknown	13	T J N	mg/Kg	☼	6.96		11/21/20 07:13	11/25/20 20:01	1
Unknown	15	T J N	mg/Kg	☼	7.04		11/21/20 07:13	11/25/20 20:01	1
Unknown	9.6	T J N	mg/Kg	☼	7.08		11/21/20 07:13	11/25/20 20:01	1
Unknown	11	T J N	mg/Kg	☼	7.11		11/21/20 07:13	11/25/20 20:01	1
1H-Indene, 2,3-dihydro-5,6-dimethyl-	18	T J N	mg/Kg	☼	7.15	1075-22-5	11/21/20 07:13	11/25/20 20:01	1
Dodecane, 4,6-dimethyl-	17	T J N	mg/Kg	☼	7.23	61141-72-8	11/21/20 07:13	11/25/20 20:01	1
Unknown	13	T J N	mg/Kg	☼	7.28		11/21/20 07:13	11/25/20 20:01	1
1H-Indene, 2,3-dihydro-1,1,3-trimethyl-	12	T J N	mg/Kg	☼	7.39	2613-76-5	11/21/20 07:13	11/25/20 20:01	1
Unknown	17	T J N	mg/Kg	☼	8.91		11/21/20 07:13	11/25/20 20:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	86		45 - 108	11/21/20 07:13	11/25/20 20:01	1
Nitrobenzene-d5 (Surr)	68		32 - 97	11/21/20 07:13	11/25/20 20:01	1
2-Fluorophenol (Surr)	66		26 - 96	11/21/20 07:13	11/25/20 20:01	1
2-Fluorobiphenyl (Surr)	74		39 - 100	11/21/20 07:13	11/25/20 20:01	1
2,4,6-Tribromophenol (Surr)	76		13 - 121	11/21/20 07:13	11/25/20 20:01	1
Phenol-d5 (Surr)	70		27 - 104	11/21/20 07:13	11/25/20 20:01	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**21**	D	13	4.2	mg/Kg	☼	11/21/20 07:13	12/02/20 15:20	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	78		45 - 108	11/21/20 07:13	12/02/20 15:20	5
Nitrobenzene-d5 (Surr)	66		32 - 97	11/21/20 07:13	12/02/20 15:20	5
2-Fluorophenol (Surr)	57		26 - 96	11/21/20 07:13	12/02/20 15:20	5
2-Fluorobiphenyl (Surr)	69		39 - 100	11/21/20 07:13	12/02/20 15:20	5
2,4,6-Tribromophenol (Surr)	58		13 - 121	11/21/20 07:13	12/02/20 15:20	5
Phenol-d5 (Surr)	62		27 - 104	11/21/20 07:13	12/02/20 15:20	5

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	ND		0.064	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:36	1
Formaldehyde	**0.27**	J	0.096	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:36	1
Glutaraldehyde	ND		0.064	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:36	1

Client Sample ID: B55-PDI-SB-10 (9-10)
Lab Sample ID: 410-21427-10

Date Collected: 11/18/20 12:30 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Percent Solids: 78.5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Butyraldehyde	*103*		*77 - 133*	*11/22/20 09:12*	*11/24/20 01:36*	*1*

Client Sample ID: DUP111820
Lab Sample ID: 410-21427-11

Date Collected: 11/18/20 00:00 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date
Matrix: Soil

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**20.9**		1.0	1.0	%			11/20/20 00:15	1

Client Sample ID: DUP111820
Lab Sample ID: 410-21427-11

Date Collected: 11/18/20 00:00 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Percent Solids: 79.1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
trans-1,3-Dichloropropene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Ethylbenzene	**0.95**	J	0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Styrene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,4-Dichlorobenzene	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2-Dibromoethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2-Dichloroethane	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
4-Methyl-2-pentanone	ND		0.59	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Toluene	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Chlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Cyclohexane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2,4-Trichlorobenzene	ND		0.59	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,4-Dioxane	ND		15	2.2	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Dibromochloromethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Tetrachloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
cis-1,2-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
trans-1,2-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Methyl tertiary butyl ether	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
m&p-Xylene	**1.2**	J	0.30	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,3,5-Trimethylbenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,3-Dichlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Carbon tetrachloride	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
2-Hexanone	ND		0.59	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Acetone	ND		1.2	0.35	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Chloroform	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Benzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,1,1-Trichloroethane	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Bromomethane	ND		0.30	0.041	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Chloromethane	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Bromochloromethane	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Chloroethane	ND		0.30	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Vinyl chloride	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Methylene Chloride	ND		0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Carbon disulfide	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Bromoform	ND	*	0.59	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50

Client Sample ID: DUP111820

Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-11

Matrix: Soil
Percent Solids: 79.1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromodichloromethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,1-Dichloroethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,1-Dichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Trichlorofluoromethane	ND		0.30	0.041	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Dichlorodifluoromethane	ND		0.30	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Freon 113	ND		0.59	0.035	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2-Dichloropropane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
2-Butanone	ND		0.59	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,1,2-Trichloroethane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
2-Nitropropane	ND	* R	0.59	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Trichloroethene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Methyl acetate	ND		0.30	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,1,2,2-Tetrachloroethane	ND		0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2,3-Trichlorobenzene	ND		0.59	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
o-Xylene	**0.16**	**J**	0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2-Dichlorobenzene	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
1,2-Dibromo-3-Chloropropane	ND		0.30	0.030	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Acetonitrile	ND		5.9	1.5	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Isopropylbenzene	**2.0**	**J**	0.30	0.024	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Chlorodifluoromethane	ND		0.59	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Cyclohexanone	ND		15	1.5	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Ethyl acetate	ND		0.30	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Ethyl ether	ND		0.30	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Isobutyl alcohol	ND		15	2.2	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Naphthalene	**0.31**	**J**	0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
n-Butanol	ND		15	3.3	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
n-Butylbenzene	**10**	**J**	0.47	0.18	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
n-Heptane	**4.0**	**J**	0.47	0.18	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
p-Isopropyltoluene	**2.3**	**J**	0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
sec-Butylbenzene	**3.8**	**J**	0.30	0.12	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
t-Butyl alcohol	ND		5.9	0.89	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
tert-Butylbenzene	**0.087**	**J**	0.30	0.047	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Tetrahydrofuran	ND		0.47	0.059	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50
Xylenes, Total	**1.4**	**J**	0.59	0.083	mg/Kg	☼	11/19/20 23:03	11/25/20 03:08	50

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Pentane, 3-methyl-	*21*	*T J N*	*mg/Kg*	☼	*4.86*	*96-14-0*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Pentane, 2,3-dimethyl-	*17*	*T J N*	*mg/Kg*	☼	*7.20*	*565-59-3*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Hexane, 3-methyl-	*24*	*T J N*	*mg/Kg*	☼	*7.32*	*589-34-4*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Heptane, 3-methyl-	*28*	*T J N*	*mg/Kg*	☼	*9.64*	*589-81-1*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Unknown	*15*	*T J N*	*mg/Kg*	☼	*10.13*		*11/19/20 23:03*	*11/25/20 03:08*	*50*
Unknown	*16*	*T J N*	*mg/Kg*	☼	*10.39*		*11/19/20 23:03*	*11/25/20 03:08*	*50*
Unknown	*30*	*T J N*	*mg/Kg*	☼	*11.12*		*11/19/20 23:03*	*11/25/20 03:08*	*50*
Unknown	*20*	*T J N*	*mg/Kg*	☼	*11.23*		*11/19/20 23:03*	*11/25/20 03:08*	*50*
Benzene, 1-ethyl-2,4-dimethyl-	*20*	*T J N*	*mg/Kg*	☼	*13.68*	*874-41-9*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Benzene, 2-ethenyl-1,4-dimethyl-	*15*	*T J N*	*mg/Kg*	☼	*14.30*	*2039-89-6*	*11/19/20 23:03*	*11/25/20 03:08*	*50*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*54 - 135*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
4-Bromofluorobenzene (Surr)	*154*	*X*	*50 - 131*	*11/19/20 23:03*	*11/25/20 03:08*	*50*

Client Sample ID: DUP111820
Lab Sample ID: 410-21427-11
Date Collected: 11/18/20 00:00 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date
Matrix: Soil
Percent Solids: 79.1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*93*		*50 - 141*	*11/19/20 23:03*	*11/25/20 03:08*	*50*
Toluene-d8 (Surr)	*116*		*52 - 141*	*11/19/20 23:03*	*11/25/20 03:08*	*50*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	**48**	D	3.0	0.35	mg/Kg	☼	11/19/20 23:03	11/25/20 03:29	500
1,2,4-Trimethylbenzene	**38**	D	3.0	0.30	mg/Kg	☼	11/19/20 23:03	11/25/20 03:29	500

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*54 - 135*	*11/19/20 23:03*	*11/25/20 03:29*	*500*
4-Bromofluorobenzene (Surr)	*145*	*X*	*50 - 131*	*11/19/20 23:03*	*11/25/20 03:29*	*500*
Dibromofluoromethane (Surr)	*86*		*50 - 141*	*11/19/20 23:03*	*11/25/20 03:29*	*500*
Toluene-d8 (Surr)	*107*		*52 - 141*	*11/19/20 23:03*	*11/25/20 03:29*	*500*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
1,2,4,5-Tetrachlorobenzene	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,2'-oxybis[1-chloropropane]	ND		0.054	0.025	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,3,4,6-Tetrachlorophenol	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4,5-Trichlorophenol	ND		0.083	0.037	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4,6-Trichlorophenol	ND		0.071	0.033	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4-Dichlorophenol	ND		0.054	0.025	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4-Dimethylphenol	ND		0.083	0.037	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4-Dinitrophenol	ND		1.2	0.42	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,4-Dinitrotoluene	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2,6-Dinitrotoluene	ND		0.062	0.029	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Chloronaphthalene	ND		0.042	0.0083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Chlorophenol	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Methylnaphthalene	ND		0.042	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Methylphenol	ND		0.083	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Nitroaniline	ND		0.062	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
2-Nitrophenol	ND		0.071	0.033	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
3,3'-Dichlorobenzidine	ND		0.42	0.12	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
3-Nitroaniline	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4,6-Dinitro-2-methylphenol	ND		0.62	0.29	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Bromophenyl-phenylether	ND		0.062	0.029	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Chloro-3-methylphenol	ND		0.062	0.029	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
3,4-Methylphenol	ND		0.062	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Nitroaniline	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Nitrophenol	ND		0.62	0.21	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Acenaphthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Acenaphthylene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Acetophenone	ND		0.062	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Anthracene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Atrazine	ND		0.54	0.25	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzaldehyde	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzo[a]anthracene	ND		0.021	0.0083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzo[a]pyrene	**0.0057**	**J**	0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzo[b]fluoranthene	**0.0074**	**J**	0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1

Client Sample ID: DUP111820
Lab Sample ID: 410-21427-11

Date Collected: 11/18/20 00:00 Date Collected is 11/12/20
Date Received: 11/19/20 11:18 Date Recorded Here is the Sample Shipment Date

Matrix: Soil
Percent Solids: 79.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[g,h,i]perylene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzo[k]fluoranthene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Bis(2-chloroethoxy)methane	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Bis(2-chloroethyl)ether	ND		0.062	0.029	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Bis(2-ethylhexyl) phthalate	**0.31**		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Butylbenzylphthalate	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Caprolactam	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Carbazole	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Chrysene	**0.0094**	J	0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Di-n-butyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Di-n-octyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Dibenz(a,h)anthracene	ND		0.021	0.0083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Dibenzofuran	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Diethyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Dimethyl phthalate	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Fluoranthene	**0.010**	J	0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Chloroaniline	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Fluorene	**0.026**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
4-Chlorophenyl-phenyl ether	ND		0.054	0.025	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Hexachlorobenzene	ND		0.021	0.0083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Hexachlorobutadiene	ND		0.096	0.046	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Hexachlorocyclopentadiene	ND		0.62	0.25	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Hexachloroethane	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Indeno[1,2,3-cd]pyrene	ND		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Isophorone	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
N-Nitrosodi-n-propylamine	ND		0.062	0.029	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
N-Nitrosodiphenylamine	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Naphthalene	ND		0.021	0.0083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Nitrobenzene	ND		0.083	0.033	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Phenanthrene	**0.061**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Aniline	ND		0.62	0.21	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Phenol	ND		0.046	0.021	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Pyrene	**0.022**		0.021	0.0042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Pentachlorophenol	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Benzyl alcohol	ND		0.62	0.21	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
n,n'-Dimethylaniline	ND		0.21	0.042	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Pyridine	ND		0.21	0.083	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
Triethylamine	ND	J	6.2	2.1	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1
1,4-Dioxane	ND		0.42	0.12	mg/Kg	☼	11/21/20 07:13	11/30/20 20:19	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*12*	*J N*	*mg/Kg*	☼	*3.24*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*4.7*	*J N*	*mg/Kg*	☼	*3.85*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, propyl-	*4.2*	*J N*	*mg/Kg*	☼	*4.97*	*103-65-1*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*4.4*	*J N*	*mg/Kg*	☼	*5.06*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, 1,2,3-trimethyl-	*5.5*	*J N*	*mg/Kg*	☼	*5.32*	*526-73-8*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Nonane, 3,7-dimethyl-	*3.8*	*J N*	*mg/Kg*	☼	*5.63*	*17302-32-8*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, 1,2-diethyl-	*4.4*	*J N*	*mg/Kg*	☼	*5.73*	*135-01-3*	*11/21/20 07:13*	*11/30/20 20:19*	*1*
Unknown	*8.4*	*J N*	*mg/Kg*	☼	*5.80*		*11/21/20 07:13*	*11/30/20 20:19*	*1*
Benzene, 2-ethyl-1,4-dimethyl-	*4.6*	*J N*	*mg/Kg*	☼	*5.94*	*1758-88-9*	*11/21/20 07:13*	*11/30/20 20:19*	*1*

Client Sample ID: DUP111820

Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Date Collected is 11/12/20
Date Recorded Here is the Sample Shipment Date

Lab Sample ID: 410-21427-11

Matrix: Soil
Percent Solids: 79.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
1,2,4-Trithiolane	12	T J N	mg/Kg	☼	6.16	289-16-7	11/21/20 07:13	11/30/20 20:19	1
Unknown	6.0	T J N	mg/Kg	☼	6.24		11/21/20 07:13	11/30/20 20:19	1
Benzene, 1,2,4,5-tetramethyl-	8.7	T J N	mg/Kg	☼	6.26	95-93-2	11/21/20 07:13	11/30/20 20:19	1
Benzene, 2-ethenyl-1,4-dimethyl-	5.3	T J N	mg/Kg	☼	6.41	2039-89-6	11/21/20 07:13	11/30/20 20:19	1
1-Phenyl-1-butene	15	T J N	mg/Kg	☼	6.47	824-90-8	11/21/20 07:13	11/30/20 20:19	1
Benzene, 1-methyl-4-(1-methylpropyl)-	7.6	T J N	mg/Kg	☼	6.51	1595-16-0	11/21/20 07:13	11/30/20 20:19	1
Unknown	6.6	T J N	mg/Kg	☼	6.56		11/21/20 07:13	11/30/20 20:19	1
Unknown	3.7	T J N	mg/Kg	☼	6.61		11/21/20 07:13	11/30/20 20:19	1
Unknown	13	T J N	mg/Kg	☼	6.75		11/21/20 07:13	11/30/20 20:19	1
Undecane, 3,6-dimethyl-	5.0	T J N	mg/Kg	☼	6.83	17301-28-9	11/21/20 07:13	11/30/20 20:19	1
Unknown	4.8	T J N	mg/Kg	☼	6.99		11/21/20 07:13	11/30/20 20:19	1
1H-Indene, 2,3-dihydro-5,6-dimethyl-	6.0	T J N	mg/Kg	☼	7.10	1075-22-5	11/21/20 07:13	11/30/20 20:19	1
Unknown	5.1	T J N	mg/Kg	☼	7.17		11/21/20 07:13	11/30/20 20:19	1
1,2,4,5-Tetrathiane	4.9	T J N	mg/Kg	☼	7.81	291-22-5	11/21/20 07:13	11/30/20 20:19	1
Unknown	48	T J N	mg/Kg	☼	9.31		11/21/20 07:13	11/30/20 20:19	1
Unknown	17	T J N	mg/Kg	☼	9.73		11/21/20 07:13	11/30/20 20:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	90		45 - 108	11/21/20 07:13	11/30/20 20:19	1
Nitrobenzene-d5 (Surr)	70		32 - 97	11/21/20 07:13	11/30/20 20:19	1
2-Fluorophenol (Surr)	63		26 - 96	11/21/20 07:13	11/30/20 20:19	1
2-Fluorobiphenyl (Surr)	70		39 - 100	11/21/20 07:13	11/30/20 20:19	1
2,4,6-Tribromophenol (Surr)	55		13 - 121	11/21/20 07:13	11/30/20 20:19	1
Phenol-d5 (Surr)	66		27 - 104	11/21/20 07:13	11/30/20 20:19	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dicyclohexylamine	**23**	D	12	4.2	mg/Kg	☼	11/21/20 07:13	11/26/20 16:09	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	81		45 - 108	11/21/20 07:13	11/26/20 16:09	5
Nitrobenzene-d5 (Surr)	68		32 - 97	11/21/20 07:13	11/26/20 16:09	5
2-Fluorophenol (Surr)	66		26 - 96	11/21/20 07:13	11/26/20 16:09	5
2-Fluorobiphenyl (Surr)	68		39 - 100	11/21/20 07:13	11/26/20 16:09	5
2,4,6-Tribromophenol (Surr)	48		13 - 121	11/21/20 07:13	11/26/20 16:09	5
Phenol-d5 (Surr)	69		27 - 104	11/21/20 07:13	11/26/20 16:09	5

Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetaldehyde	**0.036**	J	0.063	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:47	1
Formaldehyde	**1.2**	J	0.095	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:47	1
Glutaraldehyde	ND		0.063	0.032	mg/Kg	☼	11/22/20 09:12	11/24/20 01:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Butyraldehyde	93		77 - 133	11/22/20 09:12	11/24/20 01:47	1

Client Sample ID: TB20308
Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-12
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			12/01/20 13:43	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,2,3-Trichlorobenzene	ND		5.0	0.40	ug/L			12/01/20 13:43	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			12/01/20 13:43	1
1,2,4-Trimethylbenzene	ND		5.0	1.0	ug/L			12/01/20 13:43	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			12/01/20 13:43	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			12/01/20 13:43	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
1,3,5-Trimethylbenzene	ND		5.0	0.30	ug/L			12/01/20 13:43	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
1,4-Dioxane	ND		250	29	ug/L			12/01/20 13:43	1
2-Butanone	ND		10	0.30	ug/L			12/01/20 13:43	1
2-Hexanone	ND		10	0.30	ug/L			12/01/20 13:43	1
2-Nitropropane	ND		10	0.80	ug/L			12/01/20 13:43	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			12/01/20 13:43	1
Acetone	ND		20	0.70	ug/L			12/01/20 13:43	1
Acetonitrile	ND		100	16	ug/L			12/01/20 13:43	1
Benzene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Bromochloromethane	ND		5.0	0.20	ug/L			12/01/20 13:43	1
Bromodichloromethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Bromoform	ND		4.0	1.0	ug/L			12/01/20 13:43	1
Bromomethane	ND		1.0	0.30	ug/L			12/01/20 13:43	1
Carbon disulfide	ND		5.0	0.20	ug/L			12/01/20 13:43	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Chlorobenzene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Chlorodifluoromethane	ND		5.0	2.0	ug/L			12/01/20 13:43	1
Chloroethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Chloroform	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Chloromethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Cyclohexane	ND		5.0	1.0	ug/L			12/01/20 13:43	1
Cyclohexanone	ND		100	25	ug/L			12/01/20 13:43	1
Dibromochloromethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Ethyl acetate	ND		5.0	0.70	ug/L			12/01/20 13:43	1
Ethyl ether	ND		5.0	0.20	ug/L			12/01/20 13:43	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/01/20 13:43	1
Freon 113	ND		10	0.20	ug/L			12/01/20 13:43	1
Isobutyl alcohol	ND		250	36	ug/L			12/01/20 13:43	1
Isopropylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
m&p-Xylene	ND		5.0	1.0	ug/L			12/01/20 13:43	1
Methyl acetate	ND		5.0	0.30	ug/L			12/01/20 13:43	1

Client: ARCADIS U.S. Inc
Project/Site: Bristol-Myers Squibb

Job ID: 410-21427-1

Client Sample ID: TB20308
Date Collected: 11/18/20 00:00
Date Received: 11/19/20 11:18

Lab Sample ID: 410-21427-12
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Methylcyclohexane	ND		5.0	0.50	ug/L			12/01/20 13:43	1
Methylene Chloride	ND		1.0	0.30	ug/L			12/01/20 13:43	1
Naphthalene	ND		5.0	1.0	ug/L			12/01/20 13:43	1
n-Butanol	ND		250	61	ug/L			12/01/20 13:43	1
n-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
n-Heptane	ND		5.0	2.0	ug/L			12/01/20 13:43	1
o-Xylene	ND		1.0	0.40	ug/L			12/01/20 13:43	1
p-Isopropyltoluene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
sec-Butylbenzene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
Styrene	ND		5.0	0.20	ug/L			12/01/20 13:43	1
t-Butyl alcohol	ND		50	12	ug/L			12/01/20 13:43	1
tert-Butylbenzene	ND		5.0	0.30	ug/L			12/01/20 13:43	1
Tetrachloroethene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Tetrahydrofuran	ND		10	0.70	ug/L			12/01/20 13:43	1
Toluene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
trans-1,2-Dichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Trichloroethene	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/01/20 13:43	1
Xylenes, Total	ND		6.0	1.4	ug/L			12/01/20 13:43	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*12/01/20 13:43*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/20 13:43*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*12/01/20 13:43*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 120*		*12/01/20 13:43*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*12/01/20 13:43*	*1*

APPENDIX C

Low Temperature Thermal Remediation (Horst, et. el, 2018)

Groundwater
Monitoring&Remediation

Low-Temperature Thermal Remediation: Gaining Traction as a Green Remedial Alternative

by John Horst, Cullen Flanders, Mark Klemmer, Davinder Singh Randhawa, Derek Rosso

Introduction

Back in 2012 we dedicated one of our columns to the topic of temperature-activated auto-decomposition reactions as a potential mechanism for the in situ remediation of certain organic contaminants (Suthersan et al. 2012). At the time the focus was mainly on chemical reactions such as hydrolysis and dehydrohalogenation, that can be stimulated by relatively modest increases in subsurface temperature. Because of the relatively low-temperature requirements (generally less than 70 °C), it was further discussed and demonstrated that the ability to stimulate such reactions does not require massive infrastructure or energy investments.

While the ability to stimulate the rate of organic contaminant auto-decomposition by way of temperature increase has received considerable attention in remediation circles, the ability to stimulate other avenues for contaminant degradation has arguably received less attention despite the available research.

As an example, biodegradation is also temperature-dependent and approximately doubles for each 10 °C increase (sometimes more or less). For example, research comparing the biodegradation of petroleum hydrocarbons in soils at 10 °C and 20 °C has shown a threefold increase in the rate of benzene, toluene, ethylbenzene, and xylene degradation at the higher temperature (Margesin and Schinner 2001). That said, there is a practical upper limit to this phenomenon and an optimal range when it comes to biodegradation. Sticking with the petroleum hydrocarbon example, studies on biodegradation rates due to increase in temperature have shown peak degradation rates between 30 °C and 40 °C (Xu 1997).

In addition to the above, increases in temperature can affect organic contaminant properties in ways that can make them easier to physically remove from the subsurface—this is a big part of the focus of conventional thermal remediation technologies designed to achieve subsurface temperatures sufficient to rapidly eliminate gross contamination including nonaqueous phase liquids. While these conventional thermal techniques can be very useful, we should keep in mind that in some situations it may be possible to achieve sufficient improvement in chemical properties at lower temperatures to meaningfully enhance the performance of certain extraction remedies.

In the recent past, there has been quite a bit of progress on the development of low-temperature thermal remediation approaches that put all of the above together and (for situations where it can be relevant) target subsurface temperatures far lower than temperatures achieved with conventional thermal treatment techniques. Initial success stories around low-temperature thermal remediation started to emerge after conventional thermal remediation operation would cease. Truex et al. (2007) referred to it as "fortuitous" remediation where enhanced contaminant degradation was seen as temperatures cooled but remained in excess of typical background temperatures, conditions that prevailed for months following the end of subsurface heating. Consequently, practitioners started to design dialed-down versions of conventional thermal remediation.

The infrastructure requirements to achieve lower-temperature goals can be far simpler than a conventional thermal application, but still relies on the fundamentals of heat transfer. In this column we explore the basis for such approaches through a discussion of the following:

- The fundamentals of in situ heat transfer that are important to low-temperature remediation
- How temperature increase affects certain chemical properties and degradation potential
- Different techniques that can be used to support low-temperature remediation enhancement.

The last item above includes opportunities to leverage sustainable sources of heat, such as the use of geothermal energy and the capture of solar energy, significantly enhancing the green aspects of the approach. We will explore both of these with a detailed review of a solar heat transfer approach and example field application to illustrate the potential of the technique.

In Situ Heat Transfer Considerations

The application of low-temperature thermal remediation generally requires the direct in situ transfer of thermal energy (heat) from a heat source to the subsurface, as opposed to generating it through power dissipation or other

© 2018, National Ground Water Association
doi: 10.1111/gwmr.12295

means that can reach higher-temperature targets. The fundamentals of heat transfer involve the following three primary mechanisms:

- *Conduction*. This mechanism requires physical contact and is driven by the temperature difference between two matrices. The area of higher energy/heat will transfer that energy to the area of lower energy/heat to seek equilibrium. The rate of transfer and degree of heating that is accomplished are affected by the magnitude of the temperature difference (gradient), the surface area involved in the transfer, the properties of the matrices through which the heat must be transferred, and the length of the travel path.
- *Convection*. This mechanism also requires contact and involves fluids, which expand and become less dense when heated. This density change causes the hot fluid to rise, displacing cooler fluid which will sink. This can set up a circular current until the fluid temperature approaches the temperature of the heat source, which is generally a solid surface. Similar to conduction, convection is driven by the magnitude of the temperature difference (gradient), the surface area of the heat source, and the properties of the fluid (including its bulk motion).
- *Radiation*. This is the only transfer mechanism that does not require direct contact. All objects radiate thermal energy based on their temperature, the hotter the object the more it radiates.

Conduction is the main heat transfer mechanism that is relied upon in the subsurface to implement low-temperature environmental remediation applications. At the soil surface, heat can be lost due to radiation, a factor that must be considered in certain designs. Convection is usually negligible in the subsurface as it would require incredibly permeable and stable volume conditions. More often, advection (the flow of fluids) can inhibit heating by continuously exchanging the fluid volume with fresh unheated fluid, a factor that must be considered in designs (similar to radiation).

To help explain, we can consider a unit volume (Volume) within the subsurface that contains solid material and void space (i.e., pores). The solid material can consist of different types of rocks, minerals, and organic materials of various shapes and sizes. The pore space can contain varying amounts of air, vapors, and liquids. The composition of the Volume leads to variations in the thermal properties. Heat transfer within the Volume will primarily involve effective thermal conductivity. Thermal conductivity is the property of a material to conduct heat. It is evaluated primarily in terms of the Fourier's law for heat conduction and is represented by Equation 1.

$$q''x = -k\left(dT / dx\right), \tag{1}$$

where $q''x$ is the heat flux in the x direction (W/m^2), k is the effective thermal conductivity (W/m/K), and dT/dx is the temperature gradient in the x direction (K/m).

Heat capacity is another important physical characteristic of any material relative to the ability to conduct heat and represents the ratio of heat added to (or removed from) an object to the resulting temperature change. This can then be used to determine the thermal diffusivity of a material, which is a measure of a material's ability to conduct heat relative to its ability to store heat (i.e., thermal conductivity divided by heat capacity). Equation 2 defines thermal diffusivity (cm^2/s), which is usually denoted as α,

$$a = k / \left(\rho CP\right), \tag{2}$$

where k is thermal conductivity (W/m/K), ρ is the density (kg/m^3), and C_P is the specific heat capacity (J/kg/K).

WHEN heat is applied to a unit volume of soil, the heat flux through the Volume will depend on the effective thermal conductivity and the corresponding rise in temperature will depend on the thermal diffusivity (in turn controlled by specific heat capacity) and amount of time involved in the heat transfer. Table 1 lists some thermal properties of some subsurface materials, certain metals often used to construct heat exchange elements, and fluids. Air conducts heat poorly. Soil, rock, and water are much better, and metals are the best conductors. Dry soil, rock, and metal have low heat capacities, while water has a high heat capacity.

From a practical perspective, the heat transfer properties of a subsurface soil matrix do not vary considerably, unlike hydraulic properties which can vary many orders of magnitude. Consequently, where relevant, low-temperature thermal remediation can reach contaminant mass that remediation technologies reliant on subsurface permeability characteristics cannot readily access. In low-permeability formations an entire targeted treatment zone can be heated to a desired treatment temperature regardless of the challenges in moving fluids through the same formation.

While the above is true, careful consideration of the subsurface properties is important to ensure that a low-temperature thermal remediation system design will ultimately raise the temperature of the subsurface to the desired target in the desired timeframe. Effective thermal conductivity and diffusivity do still vary (Brigaud and Vasseur 1989; Abu-Hamdeh 2003), which requires an understanding of subsurface composition, and thermal modeling to simulate the subsurface temperatures expected to be achieved. The modeling can predict the magnitude of heating that can be achieved relative to remediation goals, by factoring in the

Table 1
Thermal Properties of Some Subsurface Materials, Certain Metals Often Used in Heat Exchanger Elements, and Fluids

Material	Average Thermal Conductivity, k (W/m/K)	Average Heat Capacity, C_p (J/K/kg)	Average Thermal Diffusivity, α (cm^2/s)
Dry soil	0.25	800	0.003
Saturated soil	0.6–5	1480	0.011
Rock (sandstone for example)	2.9	930	0.014
Water	0.58	4180	0.001
Air	0.024	1000	0.218
Steel	16–36	490	0.065
Copper	400	390	1.167

Note: Adapted from Engineering Tool Box, https://www.engineeringtoolbox.com.

heat source, the properties of the subsurface matrix, and the impact of things like heat loss due to radiation and advection. We will discuss this further below.

Temperature Driven Changes in Chemical Properties

As the temperatures in the subsurface change, the chemical properties of the contaminants of concern will also change. For the purposes of this discussion we will focus on the enhancing effect on contaminant partitioning followed by contaminant degradation.

Contaminant Partitioning

In general, an increase in temperature increases the solubility of higher molecular weight organic contaminants in water, making them easier to recover. However, this needs to be carefully considered because certain contaminants behave differently has temperatures change. Solubility data for some compounds, particularly petroleum hydrocarbons, have been published with contrasting views likely due to variables such as degradation and vaporization impacting the results. Figure 1 below compares the solubility of benzene with that of trichloroethene, tetrachloroethene, and methyl tert butyl ether (MTBE). As can be seen, benzene solubility steadily increases between 20 °C and 50 °C. By comparison, the solubility of trichloroethene and tetrachloroethene is relatively stable at temperatures less than 60 °C and would therefore see limited change in solubility during the implementation of low-temperature thermal remediation. Finally, as an example of an exception, the solubility of MTBE decreases as temperature increases.

The increase in temperature can also enhance dissolved phase/vapor phase partitioning for those same higher molecular weight chemicals as measured by changes in Henry's law constants, as shown in Figure 2. Henry's law constants represent the proportionality between the gas phase and the dissolved phase for volatile contaminants, so as the Henry's law constant increases so does the susceptibility of those contaminants to partitioning from the dissolved phase to the vapor phase.

Physical extraction systems (e.g., ex situ groundwater treatment, air sparge/soil vapor extraction) remain important conventional solutions to address contaminant mass, particularly in zones of high concentration. When considered together with low-temperature thermal technology, the potential to increase solubility and susceptibility to volatilization can make the recovery of organic contaminants far easier. This does not replace conventional thermal treatment, but can potentially offer a low-cost way to improve the effectiveness of an existing physical extraction system.

Chemical Degradation

Temperature increases will also often increase abiotic/chemical and biotic reaction rates, which can contribute to contaminant degradation. In the category of chemical reactions, we can focus on hydrolysis reactions, which generally stated include the reaction of a dissolved compound with either water or the components of water (H^+ and OH^-). In

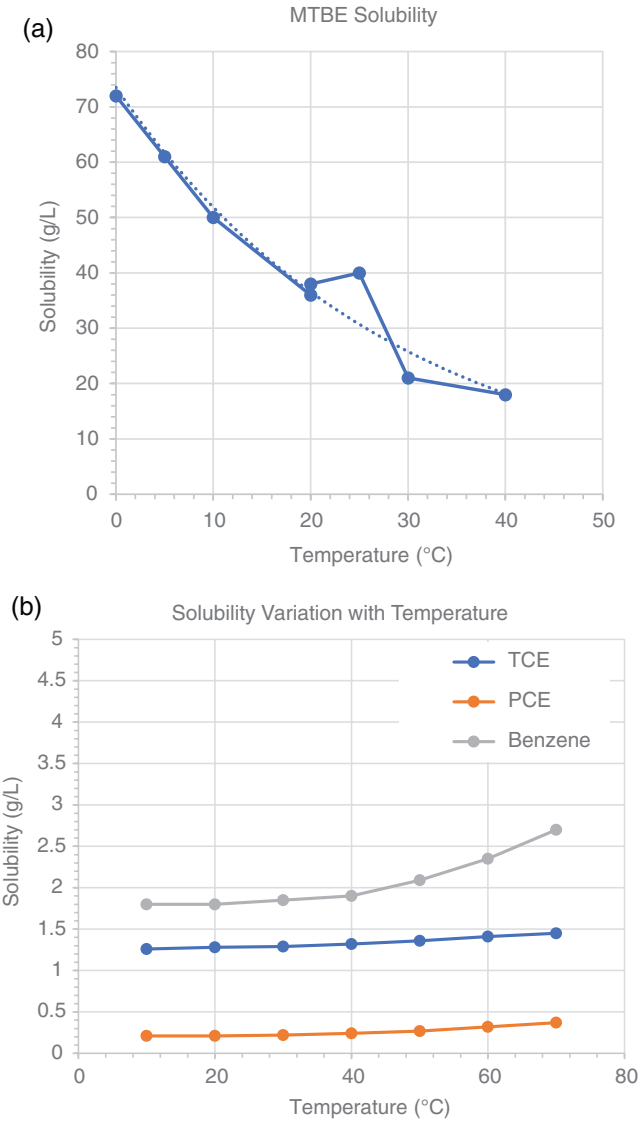


Figure 1. Temperature-dependent water solubility of MtBE (a), and benzene, PCE, and TCE (b). (Figure 1a adapted from Fischer et al. 2004 and Peters et al. 2002. Figure 1b adapted from Stephen and Stephen 1963 and Knauss et al. 2000).

1990, the USEPA conducted a pathway analysis associated with the hydrolysis of acrylonitrile and several pesticides along with various chlorinated alkanes: carbon tetrachloride (CT), chloroform (CF), 1,2-dichlorothane (1,2-DCA), methylene chloride (MC), 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane (1,1,2-TCA), 1,1,1,2-tetrachloroethane (1,1,1,2-TCA), and 1,1,2,2-tetrachloroethane (1,1,2,2-TCA) (Kollig et al. 1990). A number of other studies have also presented temperature effects and reaction by-products for hydrolysis and dehydrohalogenation reactions (Mabey and Mill 1978; Gerkens and Franklin 1989; Jeffers et al. 1989; Washington 1995; Jeffers and Wolfe 1996; Pagan et al. 1998).

For chlorinated alkanes, hydrolysis predominantly involves reactions that can be classified into two pathways and that can occur simultaneously. The first is hydrolysis, which is defined as the decomposition of a dissolved chemical compound via a substitution reaction with water (Washington 1995). The hydrolysis reaction typically proceeds by

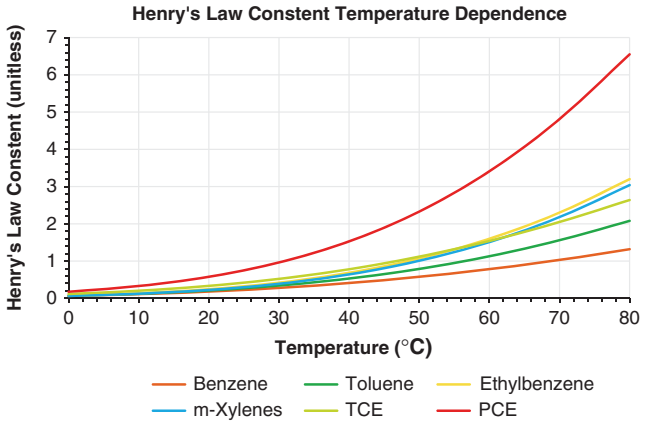


Figure 2. Changes in Henry's law constant with temperature for selected hydrocarbons. (adapted from Shukla and Hicks 1984).

the nucleophilic substitution of a halogen with a hydroxyl anion, as shown for 1,1,1-trichloroethane. Hydrolysis of 1,1,1-TCA produces 1,1-dichloroethanol as an intermediate (Equation 3) before further hydrolyzing to acetic acid (Equation 4).

$$\underset{(1,1,1\text{-TCA})}{CH_3CCl_3} + H_2O \rightarrow \underset{(1,1\text{-dichloroethanol})}{CH_3CCl_2OH} + H^+ + Cl^- \quad (3)$$

$$\underset{(1,1\text{-dichloroethanol})}{CH_3CCl_2OH} + H_2O \rightarrow \underset{(\text{acetic acid})}{CH_3COOH} + 2H^+ + 2Cl^- \quad (4)$$

The second is dehydrohalogenation, or base-mediated hydrolysis reaction, which proceeds by the elimination of a halogen bonded to one carbon atom, with the simultaneous removal of a hydrogen bonded to a neighboring carbon atom. As a result of the elimination of the halogen and hydrogen, a double bond is formed between the participating carbon atoms, replacing the original single bond. Equation 5 shows hydrolysis of 1,1,2-trichloroethane to produce 1,2-dichloroethene.

$$\underset{(1,1,2\text{-TCA})}{Cl_2CHCH_2Cl} \rightarrow \underset{(1,2\text{-DCE})}{ClCHCHCl} + H^+ + Cl^- \quad (5)$$

The dominance of either the hydrolysis or dehydrohalogenation reaction depends on the reaction kinetics, which are compound-specific but controlled by pH and temperature. For 1,1,1-TCA the ratio of acetic acid to 1,1-DCE will typically yield approximately 80% acetic acid and 20% 1,1-DCE at neutral pH (Scheutz et al. 2011). This means that for 1,1,1-TCA, abiotic reactions have the potential to reduce contaminant mass by as much as 80%. The low concentrations of lesser chlorinated reaction products (1,1-DCE) derived from the reactions may require a polishing step, but can often simply be monitored.

A third reaction pathway exists, although is not likely to be very effective for chlorinated alkanes or alkenes. The acid mediated hydrolysis reaction is effective for compounds which contain an ether structure, such as bis(chloroethyl) ether/BCEE (Kankaanpera 1969). The acid mediated pathway reacts by attacking the lone pair of electrons on the oxygen atom to disrupt the structure, then simultaneously adding an H^+ to part of the molecule and OH^- to the other to form two molecules of the intermediate product (2-chloroethanol) and further degrading to ethylene glycol.

$$\underset{(\text{BCEE})}{ClCH_3CH_3OCH_3CH_3Cl} + H_2O \rightarrow \underset{(2\text{-chloroethanol})}{2ClCH_3OH} \quad (6)$$

$$\underset{(2\text{-chloroethanol})}{ClCH_3CH_3OH} + H_2O \rightarrow \underset{(\text{ethylene glycol})}{HOCH_3CH_3OH} + H^+ + Cl^- \quad (7)$$

Because the reactions are temperature-dependent, the half-lives for hydrolysis and dehydrohalogenation reactions can be determined using the Arrhenius equation, shown in Equation 8,

$$K = A\exp\left(-E_A / RT\right) \quad (8)$$

where K is the rate constant, A is the pre-exponential factor (often called the frequency factor, relating to the collision of molecules involved in the reaction), E_A is the activation energy (minimum energy required for the reaction to proceed), R is the universal gas constant (pressure-volume product per temperature unit per mole), and T is the absolute temperature.

Using the Arrhenius equation and published values for A and E_A (Jeffers et al. 1989; Washington 1995; Jeffers and Wolfe 1996), Figure 3 summarizes the calculated hydrolysis half-lives for a number of chlorinated compounds that might be expected at neutral groundwater pH and temperatures ranging from 10 °C to 95 °C. The figure shows that moderate increases in temperature can shorten abiotic half-lives by orders of magnitude. The half-life of 1,1,1-TCA, for example, reduces from 4600 to 41 days by heating groundwater from 10 °C to 40 °C. The increase in kinetic reaction rate means the reactions become environmentally relevant in terms of using a mild heating approach to move a site toward closure. Chlorinated alkenes such as tetrachloroethene (PCE) and trichloroethene (TCE) (not shown) are highly recalcitrant to hydrolysis at neutral pH even at higher temperatures, while chlorinated alkanes are much more amenable. It is worth noting, however, that some compounds such as TCE have elevated hydrolysis reaction rates where the pH of the system is very high and base-mediated hydrolysis reactions can dominate.

As mentioned in our 2012 column, hydrolysis reaction end products must also be carefully considered. For example, the various forms of TCA will degrade to produce more recalcitrant chlorinated alkenes that must be managed as part of the overall treatment approach. This does not always require a polishing treatment step, but in some cases can simply rely on natural attenuation.

Biological Degradation

Increases in temperature also have favorable benefits on biological reaction rates. The microbial processes are a significant factor with respect to the metabolism of soil and groundwater contaminants, such as petroleum hydrocarbons, polycyclic aromatic hydrocarbons, and chlorinated hydrocarbons. Microorganisms are often classified on their optimal temperature range. Table 2 lists the classifications

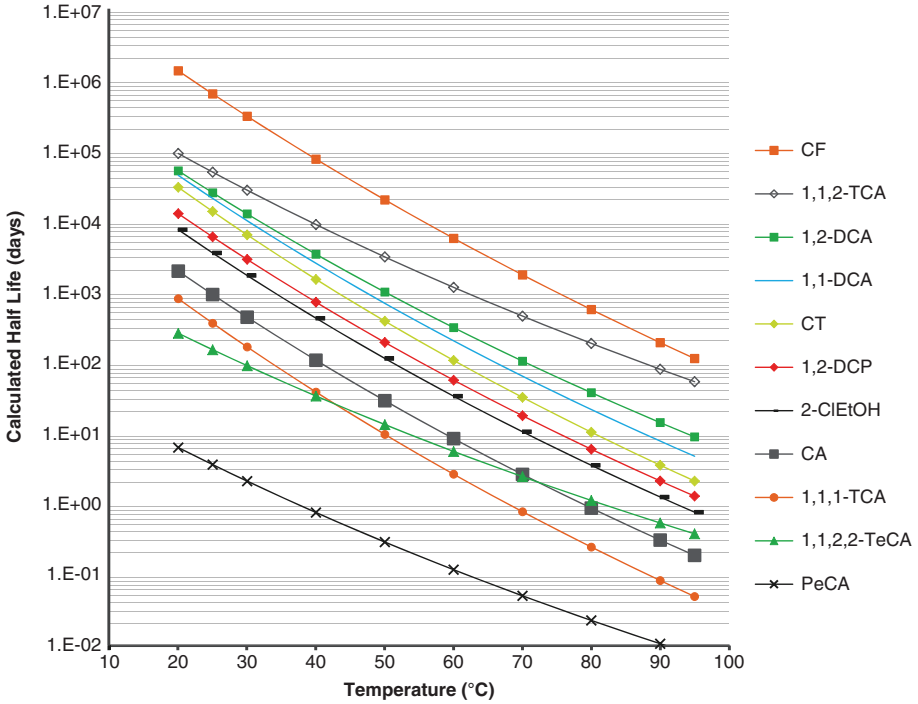


Figure 3. Calculated hydrolysis half-lives vs. temperature for selected contaminants at neutral groundwater pH. Contaminants shown include chloroform (CF); 1,1,2-trichloroethane (1,1,2-TCA); 1,2-dichloroethene (1,2-DCA); 1,1-dichloroethane (1,1-DCA); carbon tetrachloride (CT); 1,2-dichloropropane (1,2-DCP); 2-chloroethanol (2-ClEtOH); chloroethane (CA); 1,1,1-trichloroethane (1,1,1-TCA); 1,1,2,2-tetrachloroethane (1,1,2,2-TeCA); and pentachloroethane (PeCA). (adapted from Jeffers et al. 1989; Washington 1995; Jeffers and Wolfe 1996).

Table 2
Classification of Microorganisms According to Their Optimal Operating Temperature Range

Classification	Temperature Range
Psychrophilic	0–20 °C
Mesophilic	20–40 °C
Thermophilic	40–80 °C
Hyperthermophilic	80 to >100 °C

of microorganisms and their operating temperature range (Dettmer 2002).

The use of mesophiles and thermophiles for biodegradation of hydrocarbons with low water solubility is of interest, as solubility and subsequent bioavailability, are enhanced at elevated temperatures (Margesin and Schinner 2001). Many microorganisms that use contaminants are most effective at temperatures ranging from 15 °C to 40 °C (Daniel et al. 2000). Inversely, decreasing the temperature causes an increase in degradation timeframes. Twofold increase in hydrocarbon degradation time was observed for every 10 °C decrease in temperature (Yadav et al. 2012). Yadav et al. (2012) also highlighted the adaptability of the hydrocarbon degraders under induced temperature variations equivalent to summer, winter and spring conditions; and further inducing diurnal temperature changes within the seasonal ranges of the subsurface temperatures.

Bioreactor studies on the effect of temperature on the biodegradation rate of hydrocarbons for temperatures ranging from 5 °C to 50 °C show a peak degradation rates were achieved for 30 to 40 °C. Both heating and forced aeration significantly affected the biodegradation of hydrocarbons, but the effect of the former was greater (Xu 1997).

Low-Temperature Heating Methods

There are several heating methods available to achieve modest increases in subsurface temperature, where the overall target is in the range of 70 °C or less. These include conventional heating systems which create or capture heat from another process (this can include waste heat) and divert it to the subsurface, capturing heat from solar radiation. Both are discussed further below.

Conventional Heating

A conventional heating system involves the use of fuel or electricity to generate the energy that will be transferred to the subsurface. The capital costs for installing conventional heating systems can be relatively low (making use of simple equipment such as in-line/instantaneous water heaters, etc.) but require a traditional energy source that may be challenging depending on the site location. To make a conventional system more green, another option is to look for opportunities to capture waste heat from an existing nearby industrial process. Design and implementation are often fairly straightforward depending on the location and characteristics of the process stream or equipment creating the waste heat.

Such systems generally require minimal operation and maintenance effort, typically involving inspections, failsafe testing, and performance monitoring. A system that uses waste heat provides a beneficial reuse and will of course

require no uses for the heating unit but will be dependent on the operation of the equipment or process that is generating the waste heat. Therefore, the potential for operation interruptions should be considered. Also, to be cost effective and make the most of the waste heat with minimal losses, the target treatment area would need to be proximal to the process generating the waste heat.

Geothermal Heat Pumps

Low-temperature geothermal heating use is increasing in the residential sector. Geothermal methods exchange heat with the subsurface via embedded heat exchangers and above-ground heat pump equipment. The heat pumps use the subsurface as a heat source or a heat sink depending on the operational mode, making use of a transfer fluid from which heat is extracted (for heating) or to which waste heat is discharged (for cooling). The transfer fluid is then refreshed by exchanging heat with the tremendous heat capacity in the subsurface.

When discharging heat, geothermal heat pumps can increase the natural temperature of the soil from 8 ° to 12 °C up to 30 °C to 40 °C. Environmental engineers and policy makers are recognizing the "positive side effects" of such open-loop extraction and injection-based heating-cooling systems for contaminant attenuation and enhanced biodegradation in urban groundwater legacy plumes (Slenders et al. 2010; Verburg et al. 2010).

One example is a former industrial facility in Europe that started its activities in 1915 and at its peak, employed more than 10,000 people. As a result of decades of industrial activity, soil and groundwater at the site were contaminated with chlorinated solvents to a depth of 60 to 70 m below ground surface (bgs). In 2009, an approach was implemented combining groundwater remediation with a geothermal energy system to support the facility, called "Sanergy" (Figure 4). This was a first of its kind harnessing of a site mechanical system to benefit remediation (Slenders and Verburg 2010). Since implementation, regulatory closure has been achieved for the remediation and the site continues to be part of an active technology headquarters for the owner.

Solar Heating

The use of solar energy in the field of remediation has been tried by many practitioners over the past couple of decades. As an example, Rossman et al. (2006) used a "hybrid photovoltaic/wind electric system" equipped with resistive heating elements. Successful ex situ treatment of mercury contaminated soil by use of a solar reflection approach was reported by Martinez et al. (2009).

There are practical limitations to the use of solar power for remediation but the conversion of solar radiation to energy continues to grow in popularity as the efficiency of the conversion equipment increases and infrastructure costs decrease. Capitalizing on the improvement of solar collection devices, low-temperature remediation is becoming possible at a very low cost.

One low-temperature remediation system that involves the direct use of solar energy for subsurface heating is known as the Thermal In-Situ Sustainable Remediation (TISR™) system. This system transfers solar radiation to the subsurface by means of solar collectors, a closed loop heat transfer fluid system, and borehole heat exchangers designed to maximize the conductive transfer of heat to the subsurface. The solar collectors heat a fluid generally consisting of propylene glycol and distilled water. The heated fluid is pumped by a small transfer pump through insulated manifolds and subsurface tubing to in situ borehole heat exchangers (BHEs) as shown in Figure 5. Since the system uses solar energy, there are no utility costs incurred for the heating unit, with minor power consumption to operate controls and a recirculation pump. Due to the minor electrical requirements for the controls and recirculation pump, a photovoltaic solar panel may be used to power the system allowing for remote application isolated from traditional power sources.

TISR™ systems use evacuated tube collectors which collect solar energy and focus it on a heat transfer fluid passing through a thinner copper tube within the vacuum. Custom BHEs are fabricated for each site based on the depth to water, extent of impacts, water and soil chemistry, and constructability. Typically, BHEs are installed in a vertical orientation within the saturated

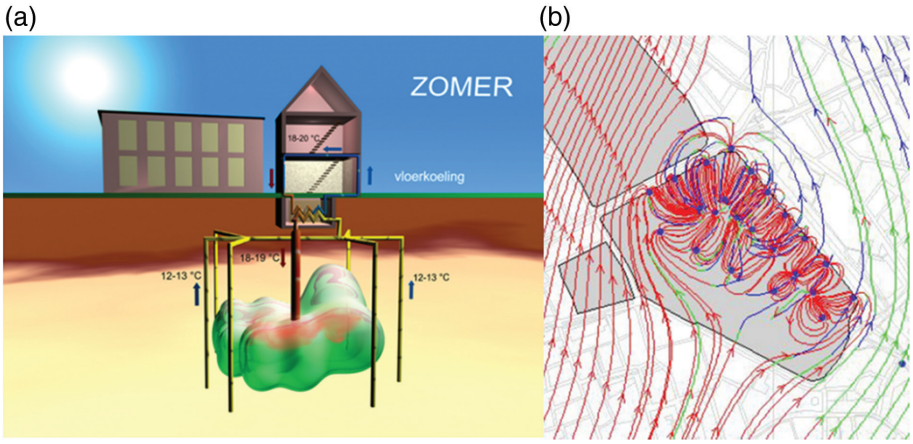


Figure 4. Sanergy geothermal remediation system using heat-cold storage associated with commercial geothermal heating and cooling for the building, to enhance bioremediation. An iterative process with flowpath using a solute transport model concluded that the contaminant flux exiting the site was reduced by a factor of 4 (Slenders et al. 2010).

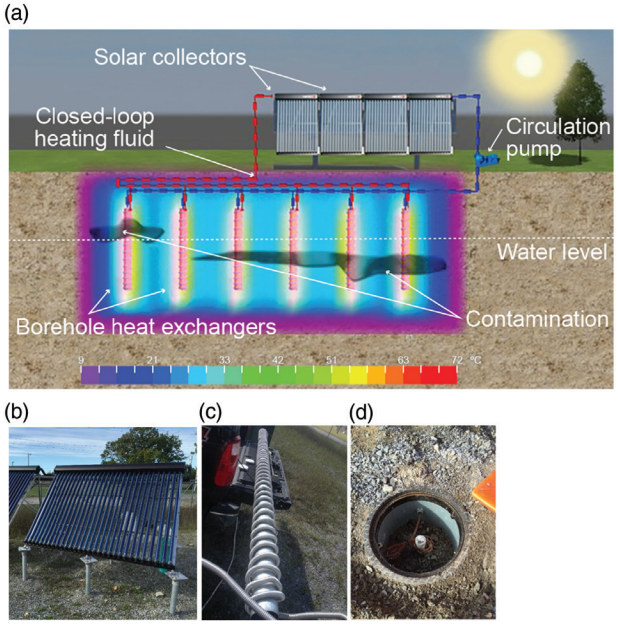


Figure 5. TISR™ System schematic at top, with photographs of the solar collectors (a), an early version of the borehole heat exchangers (b) and the thermocouple (c).

zone. Multiple BHEs are oriented in parallel to optimize the heat transfer by maintaining a maximum change in temperature between the subsurface and the BHE at all locations.

The use of solar energy is a sustainable application but is of course dependent on adequate solar radiation. The magnitude and duration of radiation varies based on such site characteristics as cloud cover, elevation, and latitude and also changes seasonally due to sun angle and daylight length. Air temperature is less of a factor. Table 3 shows the results from a real field application, demonstrating the ability to capture significant heat energy when the sun is available, regardless of outside air temperature.

The availability of space for the installation of the solar collectors, potential obstacles blocking the solar radiation for all or part of the day, and the possibility for the solar collectors to be periodically covered (leaves, snow, dust, etc.) all must be considered during the design phase. The direct use of solar energy for subsurface heating is a diurnal process which provides a heating period followed by a period of no heating each 24-h period. This creates a pulsed approach to heating the subsurface. Extended periods of cloud cover and no or limited heating may have detrimental effects on sustaining temperatures, but the diurnal pulsing allows for temperature equilibration during the period of no heating. This actually increases temperature gradients at the borehole heat exchangers for the next day, which appears to allow for greater heat transfer compared to using a heat storage unit to support continuous heating.

Table 3
Field Data Demonstration of the Ability to Capture Solar Energy Regardless of the Ambient Air Temperature

Outside Air Temp (°F)	Weather Conditions/ Cloud Cover	Collector Temp (°F)
38	Rain/overcast	39
37	Rain/overcast	43
36	Partly cloudy	115
57	Partly cloudy	114
15	Sunny	275
55	Sunny	235
30	Sunny	356

As part of the design of any thermal remediation approach, thermal modeling software is typically used to simulate the subsurface temperatures expected to be achieved. The modeling is used to determine the magnitude of impact that certain parameters have on the heating, such various sources of heat loss. To improve the accuracy of such predictions, there has been significant work to better predict thermal conductivity for such applications (Trillat-Berdal et al. 2006; Haigh 2012). The modeling software FlexPDE® has been used for TISR™ applications, with empirical data captured and used to continually refine the modeling capabilities. Figure 6 depicts the modeling output for an upcoming TISR™ installation showing the ability to achieve temperatures between 40 °C and 70 °C.

In operation, the TISR™ system is optimized through data collection from a combination of monitoring wells and thermocouples. Typically, thermocouple points will be installed at varying distances and depth intervals to gain a three-dimensional view of the temperature profile of the subsurface. In addition, groundwater samples for constituents of concern, geochemical parameters, and evidence of contaminant degradation are collected to evaluate the progress of the treatment.

Current TISR™ projects exist at various stages of progression in Colorado, New Jersey, Las Vegas, Brazil, and Mexico. A 2-year pilot test was concluded in 2017 at a site in upstate New York. Groundwater impacts were primarily composed of petroleum hydrocarbons. As shown by Figure 7, baseline total volatile organic compound (VOC) concentrations near the BHE points ranged from 17 to 3 ppm (average 12 ppm).

The TISR™ application at this site was able to reduce the VOC concentrations by 99.9% in less than 2 years (Figure 8). In approximately 18 months, the temperature of the treatment area was raised from an average of approximately 12 °C to an average of approximately 20 °C. The system was shut down to evaluate post-treatment rebound. After treatment an average VOC concentration of 0.001 ppm was reported in the test area and for about the past year concentrations have remained below detection limits. The overall capital cost was approximately $80,000 for the design and installation of two solar collectors and equipment, enhanced sensors, three borehole heat exchangers, six thermocouple observation wells, and installation of subsurface conveyance lines. Operating cost were estimated to be $3000 per year. The heating infrastructure (solar collectors, sensors, pump station, pump controller, and expansion tank) has since been trailer mounted and moved to address a different impacted area

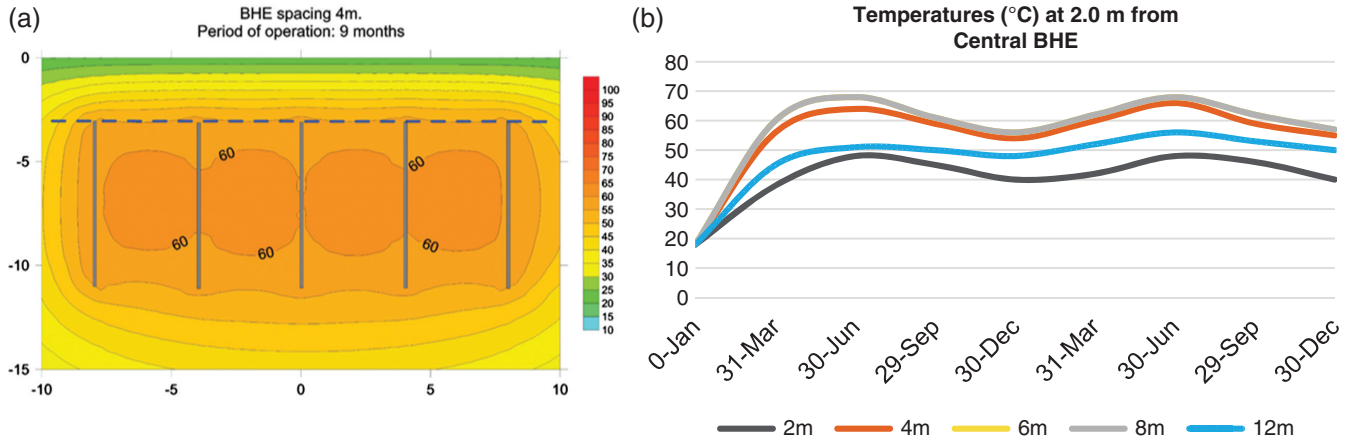


Figure 6. Example FlexPDE modeling output: (a) temperature profile in the treatment zone after 9 months of operation with BHE spacing of 4 m and (b) temperature development over time at different depths, at a point 2 m from a central BHE (mid-way between the BHEs).

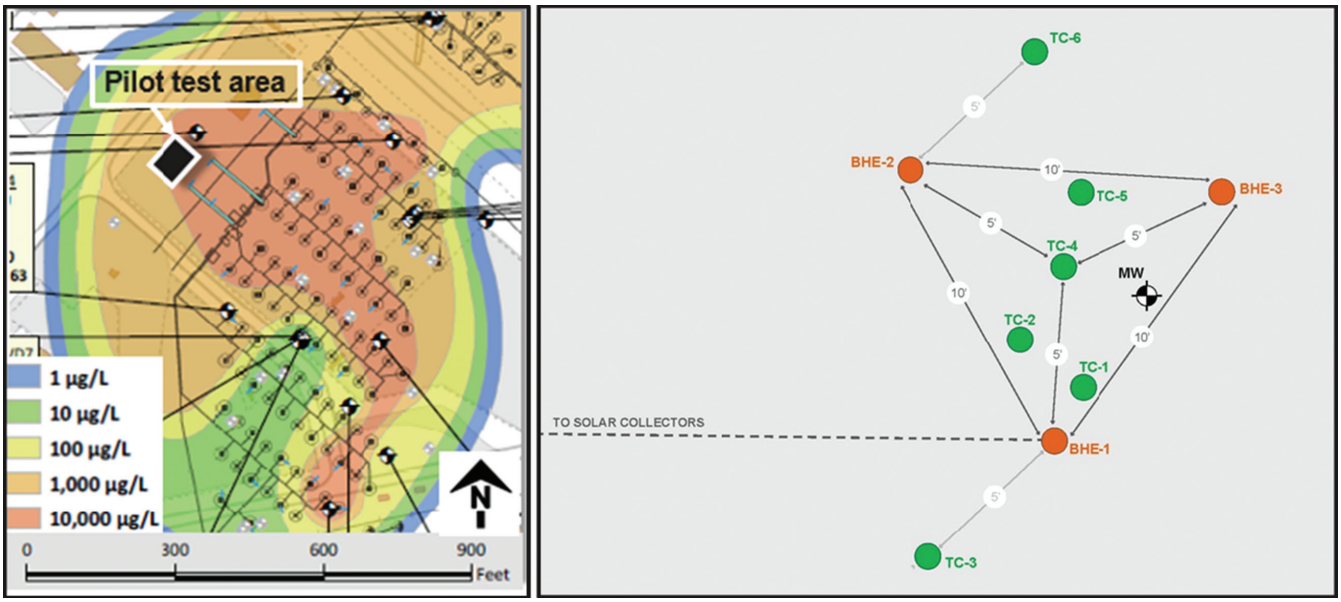


Figure 7. Fort Drum TISR™ Pilot test general layout showing Borehole Heat Exchanger (BHEs), Thermocouple points (TC), spacing among BHEs and TCs and trench connecting the BHEs to the two-30-tube evacuated tube solar collectors.

at the same site, which will continue to improve the cost-effectiveness of the technology.

A Little Heat Goes a Long Way

As remediation practitioners continue to look for opportunities to reduce clean-up time frames, reduce associated costs, and complete remediation in as sustainable a manner as possible, low-temperature thermal remediation technology will continue to gain traction as a stand-alone option or an option to enhance other more traditional remedial techniques.

As we have reviewed, the value is derived from the fact that modest increases to subsurface temperatures can result in order-of-magnitude improvements in active biodegradation rates. Further increases can be used to enhance certain abiotic reactions to target more recalcitrant chemicals (e.g., hydrolysis for chlorinated alkanes). The corresponding change in chemical properties can also be harnessed to enhance physical extraction (e.g., multi-phase recovery of contaminant mass) by driving contaminant mass from immobile phases (sorbed to soils, trapped in silts and clays) to mobile phases (dissolved and vapor). This can allow extraction systems to work more efficiently and effectively, which reduces the life cycle of the project and reducing the project costs.

This combination of potential benefits along with very modest infrastructure and operating cost, viability for remote location operation, and the potential for equipment reuse can provide a big advantage for some sites. In this manner, low-temperature thermal remediation represents yet another area of significant opportunity for remediation practitioners to show their creativity—and one that is here right now!

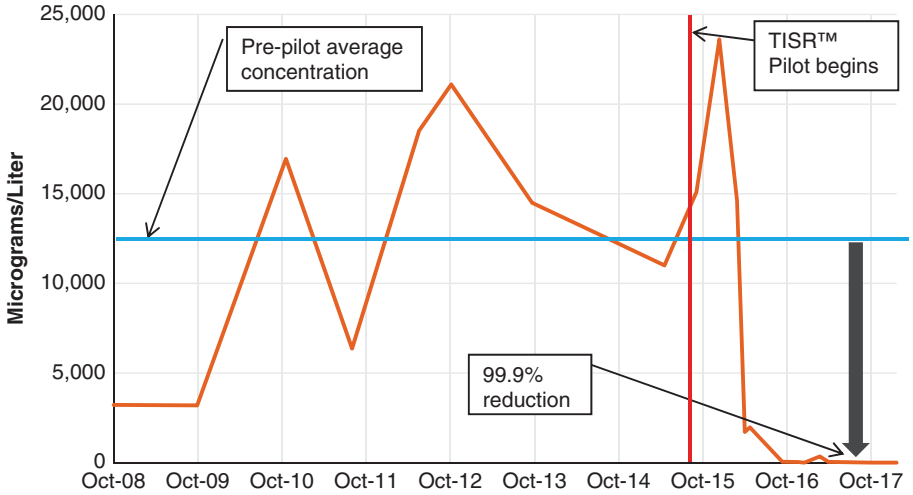


Figure 8. Average total volatile organic contaminant baseline concentrations (BTEX and Trimethylbenzenes) compared to contaminant trends observed in the Monitoring Well.

References

Abu-Hamdeh, N.H. 2003. Thermal properties of soils as affected by density and water content. *Biosystems Engineering* 86, no. 1: 97–102.

Brigaud, F., and G. Vasseur. 1989. Mineralogy, porosity and fluid control on thermal conductivity of sedimentary rocks. *Geophysical Journal International* 98, no. 3: 525–542.

Daniel, D.E., R.C. Loehr, M.T. Webster, and R.S. Kasevich. 2000. In *Soil Vapor Extraction Using Radio Frequency Heating: Resource Manual and Technology Demonstration*, ed. D.F. Lowe, C.L. Oubre, and C.H. Ward. Boca Raton, Florida: Lewis.

Dettmer, K. 2002*A discussion of the effects of thermal remediation treatments on microbial degradation processes*. Washington, DC: U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response Technology Innovation. http://www.clu-in.org (accessed March 11, 2016).

Fischer, A., M. Muller, and J. Klasmeier. 2004. Determination of Henry's law constant for methyl tert-butyl ether (MTBE) at groundwater temperatures. *Chemosphere* 54: 689–694.

Gerkens, R.R., and J.A. Franklin. 1989. The rate of degradation of 1,1,1-trichloroethane in water by hydrolysis and dehydrochlorination. 19: 1929–1937.

Haigh, S. 2012. Thermal conductivity of sands. *Geotechnique* 62: 617–625. https://doi.org/10.1680/geot.11.P.043

Jeffers, P.M., and N.L. Wolfe. 1996. Homogeneous hydrolysis rate constants—Part II: Additions, corrections, and halogen effects. 15: 1066–1070.

Jeffers, P.M., L.M. Ward, L.M. Woytowitch, and N.L. Wolfe. 1989. Homogeneous hydrolysis rate constants for selected chlorinated methanes, ethanes, ethenes, and propanes. *Environmental Science & Technology* 23, no. 8: 965–969.

Kankaanpera, A. 1969. Basicities of the oxygen atoms in symmetrical and unsymmetrical acetals. Part II. The base strengths and their relation to the rate coefficients of the different partial fission reactions of acetal hydrolysis. *Acta Chemica Scandinavica* 23: 1728–1732.

Knauss, K.G., M.J. Dibley, R.N. Leif, D.A. Mew, and R.D. Aines. 2000. The aqueous solubility of trichloroethene (TCE) and tetrachloroethene (PCE) as a function of temperature. *Applied Geochemistry* 15, no. 4: 501–512.

Kollig, H.P., J.J. Ellington, E.J. Weber, and N.L. Wolfe. 1990. Pathway analysis of chemical hydrolysis for 14 RCRA chemicals. EPA/600/M-89/009. Athens, Georgia: United States Environmental Protection Agency, Environmental Research Laboratory.

Mabey, W., and T. Mill. 1978. Critical review of hydrolysis of organic compounds in water under environmental conditions. *Journal of Physical and Chemical Reference Data* 7, no. 2: 383–415.

Margesin, R., and F. Schinner. 2001. Biodegradation and bioremediation of hydrocarbons in extreme environments. *Applied Microbial Biotechnology* 56: 650–663.

Martinez, D., J. Rodriguez, J.L. Mendoza, A. Navarro, and I. Cañadas. 2009. Application of solar thermal desorption to remediation of mercury-contaminated soils. *Solar Energy* 83: 1405–1414.

Pagan, M., W. Cooper, and J. Joens. 1998. Kinetic studies of the homogeneous abiotic reactions of several chlorinated aliphatic compounds in aqueous solution. *Applied Geochemistry* 13, no. 6: 779–785.

Peters, U., F. Nierlich, M. Sakuth, and M. Laugier. 2002. Methyl tert-butyl ether, physical and chemical properties. In *Ullmanns Encyclopedia of Industrial Chemistry*, 6th ed. Weinheim, Germany: Wiley-VCH Verlag GmbH & Co. KGaA. https://doi.org/10.1002/14356007.a16_543

Rossman, A., N. Hayden, and D. Rizzo. 2006. Low-temperature soil heating using renewable energy. *Journal of Environmental Engineering* 132: 537–544.

Scheutz, C., N. Durant, M. Hansen, and P. Bjerg. 2011. Natural and enhanced anaerobic degradation of 1,1,1-trichloroethane and its degradation products in the subsurface—A critical review. *Water Research* 45: 2701–2723.

Shukla, H., and R. Hicks. 1984. *Process Design Manual for Stripping of Organics, EPA/600/2-84/139*. Washington, DC: U.S. Environmental Protection Agency.

Slenders, H.L.A., and R. Verburg. 2010. *State of the Environment*. Copenhagen, Denmark: European Environment Agency.

Slenders, H.L.A., P. Dols, R. Verburg, and A.J. de Vries. 2010. Sustainable synergies for the subsurface: Combining groundwater energy with remediation. *Remediation* 2010: 143–153.

Stephen, H., and T. Stephen. 1963. *Solubilities of Inorganic and Organic Compounds*. Vol. 1. New York: Macmillan.

Suthersan, S., J. Horst, M. Klemmer, and D. Malone. 2012. Temperature-activated auto-decomposition reactions: An underutilized in situ remediation solution. *Ground Water Monitoring & Remediation* 32, no. 3: 34–40.

Trillat-Berdal, V., B. Souyri, and G. Achard. 2006. Coupling of geothermal heat pumps with thermal solar collectors. *Applied Thermal Engineering* 27, no. 2007: 1750–1755.

Truex, M., T. Powell, and K. Lynch. 2007. In situ dechlorination of TCE during aquifer heating. *Ground Water Monitoring & Remediation* 27, no. 2: 96–105.

Verburg, R., H.L.A. Slenders, N. Hoekstra, E. Van Nieuwkerk, R. Guijt, and B. Van der Mark. 2010. *Handleiding BOEG–Bodemenergie en Grondwaterverontreiniging, het ijs is gebroken (BOEG–Soil Energy and Groundwater Pollution Manual. The Ice is Broken)*. Den Bosch, the Netherlands: Dutch Association for Underground Energy Storage Systems.

Washington, J.W. 1995. Hydrolysis rates and dissolved volatile organic compounds: Principals, temperature effects, and literature review. *Groundwater* 33: 415–424.

Xu, J.G. 1997. Biodegradation of petroleum hydrocarbons in soil as affected by heating and forced aeration. *Journal of Environmental Quality* 26, no. 6: 1511–1516.

Yadav, B., S. Shrestha, and M. Hassanizadeh. 2012. Biodegradation of toluene under seasonal and diurnal fluctuations of soil-water temperature. *Water, Air, & Soil Pollution* 223: 3579–3588. https://doi.org/10.1007/s11270-011-1052-x

Biographical Sketches

***John Horst**, P.E., corresponding author, is Executive Director of Technical Knowledge & Innovation at Arcadis N.A., 10 Friends Lane, Ste. 200, Newtown, PA 18940; (267) 685-1800; john.horst@arcadis.com*

***Cullen Flanders**, P.E., is a Principal Environmental Engineer at Arcadis N.A., 6041 Wallace Rd. Extension Ste. 300, Wexford, PA 15090; (724) 742-9180; cullen.flanders@arcadis.com*

***Mark Klemmer**, P.E., is a Principal Environmental Engineer at Arcadis N.A., 28550 Cabot Drive Ste. 500, Novi, MI 48377; (248) 994-2260; mark.klemmer@arcadis.com*

***Davinder Singh Randhawa** is a Project Environmental Engineer at Arcadis N.A., 100 E. Campus View Blvd. Ste. 200, Columbus, OH 43235; (614) 985-9149; davinder.randhawa@arcadis.com*

***Derek Rosso**, P.E., is a Project Environmental Engineer at Arcadis N.A., 6041 Wallace Rd. Extension Ste. 300, Wexford, PA 15090; (724) 742-9180; derek.rosso@arcadis.com*

APPENDIX D

Thermal Modeling Results

APPENDIX D
THERMAL MODELING RESULTS
BUILDING 55 AREA INTERIM REMEDIAL MEASURE WORK PLAN
BMS SYRACUSE NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NEW YORK

Introduction

The Building 55 Area IRM Work Plan presents the proposed remedy for the Building 55 Area of the BMS Syracuse North Campus Restoration Area, which is a portion of the BMS Facility located at 3551 Burnet Avenue in East Syracuse, New York (the site). As indicated in the IRM Work Plan, the proposed remedy consists of Thermal In-situ Sustainable Remediation (TISR℠).

TISR℠ Technology Overview and Remedial Approach

Arcadis' patented TISR℠ is a low-temperature in-situ thermal remediation technology that involves heating subsurface media to enhance biodegradation, hydrolysis, and/or volatilization of constituents of concern in-situ. TISR℠ typically involves circulating a heated heat transfer fluid through a closed-loop piping system and subsurface borehole exchanger wells (BHE) to raise subsurface media temperatures. Heating the heat transfer fluid is achieved using solar collectors to capture solar heat, or a derived system from heat sources that may be available at a site (e.g., radiant heat from blower motors, heat from site steam).

For the Building 55 Area IRM, TISR℠ will capture heat from the BMS Boiler House steam using a heat exchanger, and then transfer the heat to the subsurface. The increased temperatures will enhance the natural attenuation processes and is anticipated to be the primary mechanism by which subsurface impacts will be addressed.

Thermal Modeling

To support the development of the TISR℠ system for the Building 55 Area, two finite element thermal models were developed using FlexPDE® (Version 7), including:

- A 3-D model developed to simulate the heat transport performance of different BHE wellfield layouts and to support the development of an optimal BHE wellfield spacing.
- A 2-D model developed to simulate the heat transport efficiency of different construction materials and to support the development of an optimal BHE construction design.

3-D Model Domain

The 3-D model domain consisted of an area of approximately 4,950 square feet (460 square meters). The model domain extended vertically from grade to a depth of approximately 164 feet (50 m). Based on the observed geology of the target treatment area, the model geologic layers consisted of fill; fine sand, silt, and clay; till; weathered bedrock; and bedrock (shale). Additionally, the water level was assumed to be present at approximately 5 feet below grade. The 3-D model layout is shown on Figure D.1 below.

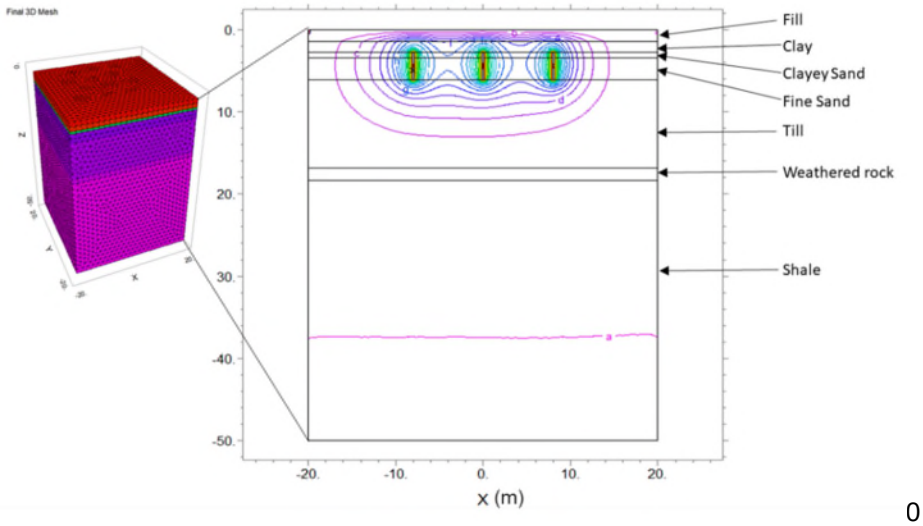


Figure D.1. 3-D Model Layout

The depth intervals and literature thermal property values used in the 3-D model layers are presented in Table D.1 below.

Table D.1. 3-D Model Layer Depth Interval and Thermal Properties1

Layer	Depth Interval (feet [m])	Thermal Conductivity (W/m*K)		Heat Capacity (J/kg*K)	
		Range	Model	Range	Model
Fill, unsaturated	0 - 8 feet [0 - 2.4 m]	0.3-0.8	0.4	1.3-1.6	1.5
Fine sand, silt, and clay	8 - 18 feet [2.4 - 5.5 m]	1.7-5.0	2.4	2.2-2.9	2.5
Till	18 -55 feet [5.5 - 16.9 m]	1.0-2.5	2.0	1.5-2.5	2.0
Weathered rock	55 - 61 feet [16.9 - 18.6 m]	1.1-2.9	1.7	2.0-2.8	2.4
Rock (shale)	> 61 feet [> 18.6 m]	1.1-2.9	2.1	2.1-2.4	2.2
Water (@ 70°C)	--		0.66		4.19

Notes:
1. W/m*K = watts per meter-Kelvin.
2. J/kg*K = joules per kilogram per Kelvin.
3. The 3-D model was developed and compiled by Arcadis Netherlands; input parameters and ranges were selected using engineering judgment from the German Engineering Association (Verein Deutscher Ingenieure [VDI], Thermal Use of the Underground, Directive VDI 4640, Part 1, Fundamentals, Approvals, Environmental Aspects (Thermische Nutzung des Untergrundes, Richtlinie VDI 4640, Blatt 1, Grundlagen, Genehmigungen, Umweltaspekte) (VDI 2000).

BHE were modeled in the (saturated) fine sand, silt, and clay unit. The influent temperature in the BHE was an assumed temperature of approximately 270°F (130°C), based on the existing Boiler House steam operational temperatures. All heating energy was assumed to be applied equally along the vertical extent of the BHE. The assumed target temperature was approximately 104°F (40°C) (halfway between BHE)

and the target time frame to reach the target temperature was approximate three months (90 days). The results of the BHE spacing configurations that were modelled are presented below.

Figure D.2. 3-D Modeling Scenario 1

Modeling Scenario 1

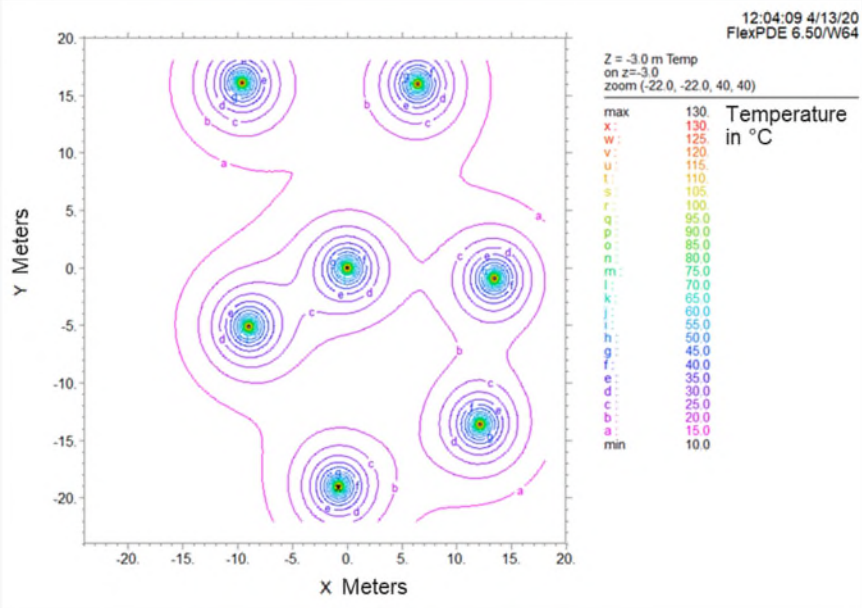
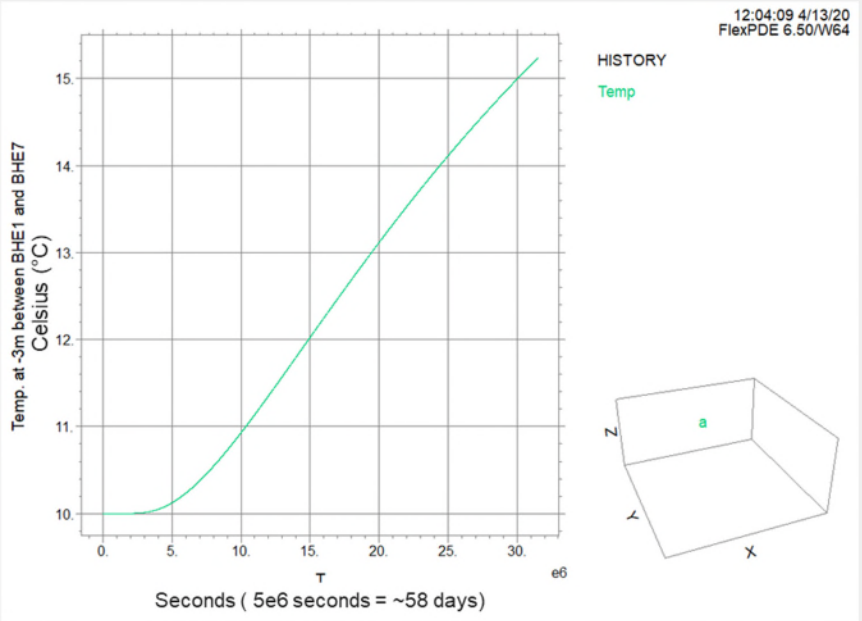
Model Parameters	Top View
• 7 BHE • Variable spacing from 36 feet (12 m) to 60 feet (20 m)	
Results	**Temperature profile at 9 feet (~3 m) below grade halfway between two BHE.**
Maximum temperature achieved between BHE after 365 days was 15.2°C (~59°F)	

Figure D.3. 3-D Modeling Scenario 2

Modeling Scenario 2

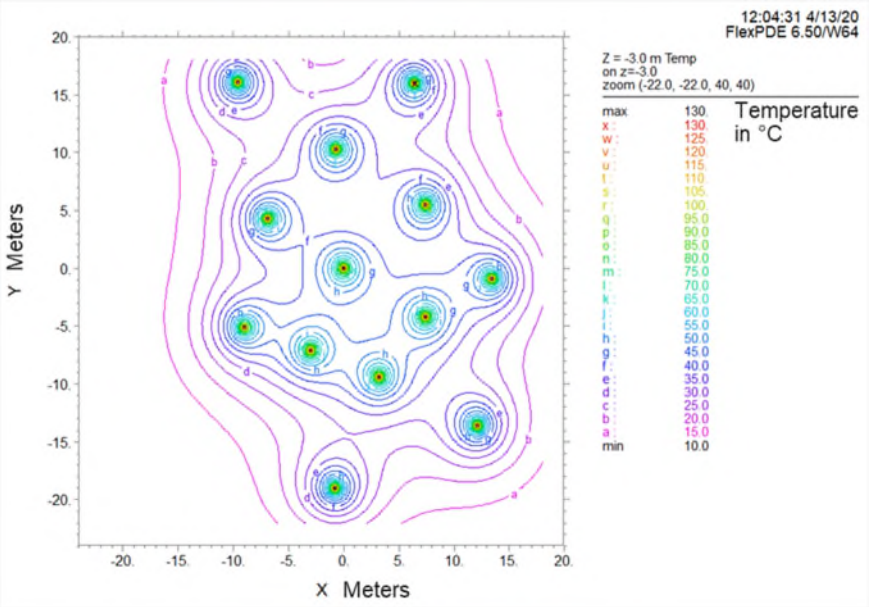
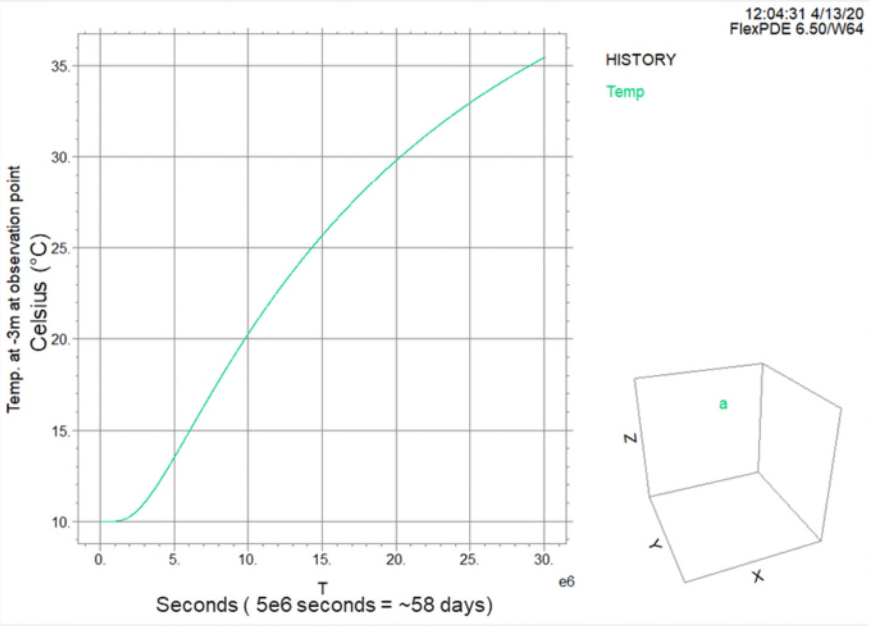
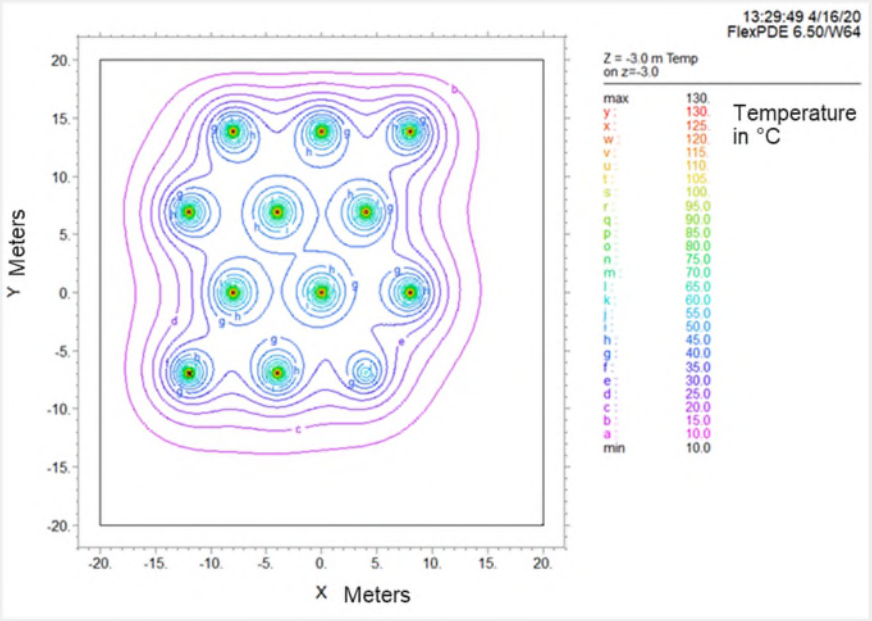
Model Parameters	Top View
• 13 BHE • Variable spacing from 20 feet (6 m) to 35 feet (10 m)	
Results	Temperature profile at 9 feet (~3 m) below grade halfway between two BHE.
Maximum temperature achieved between BHE after 350 days was 35.5°C (~96°F).	

Figure D.4. 3-D Modeling Scenario 3

Modeling Scenario 3

Model Parameters	Top View
• 12 BHE • 26 feet (8 m) spacing	

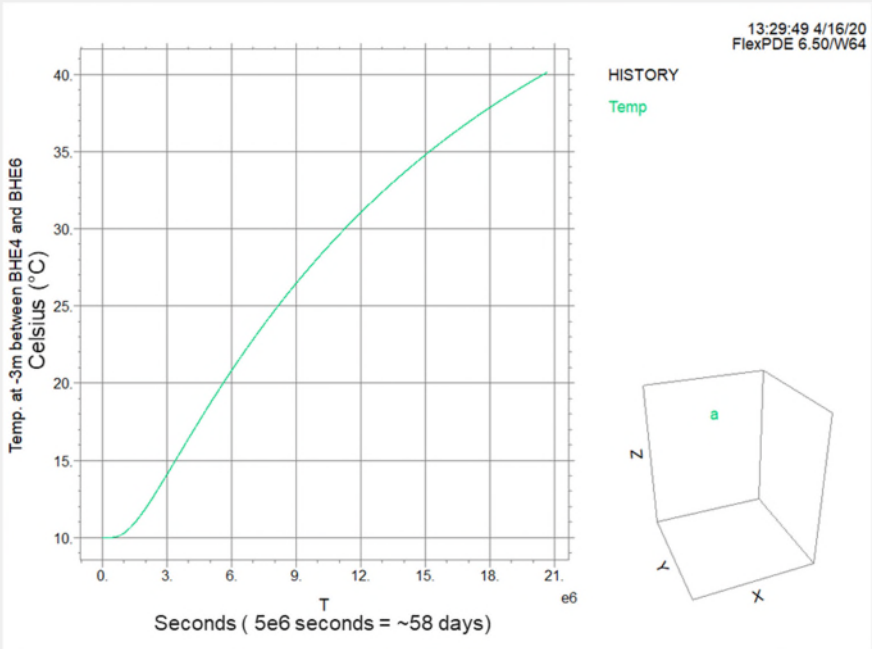
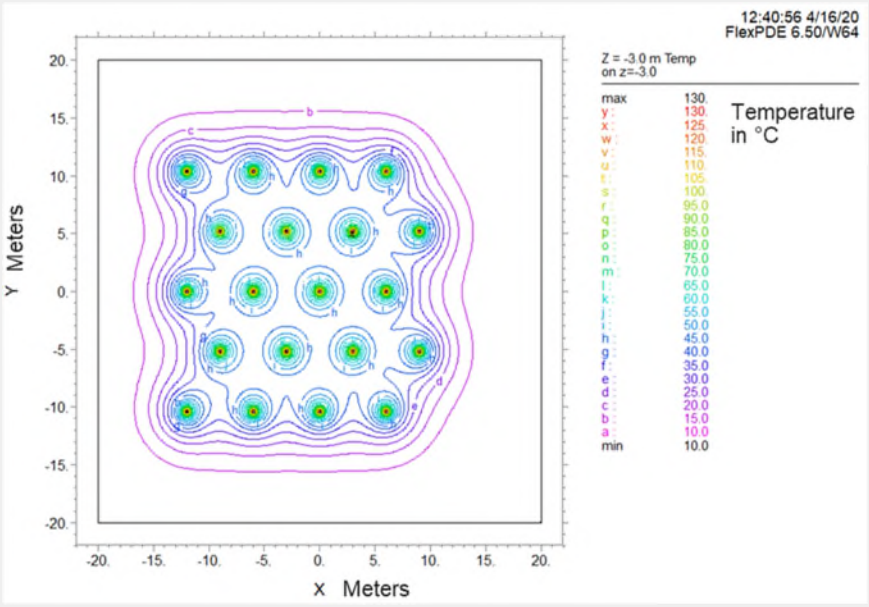
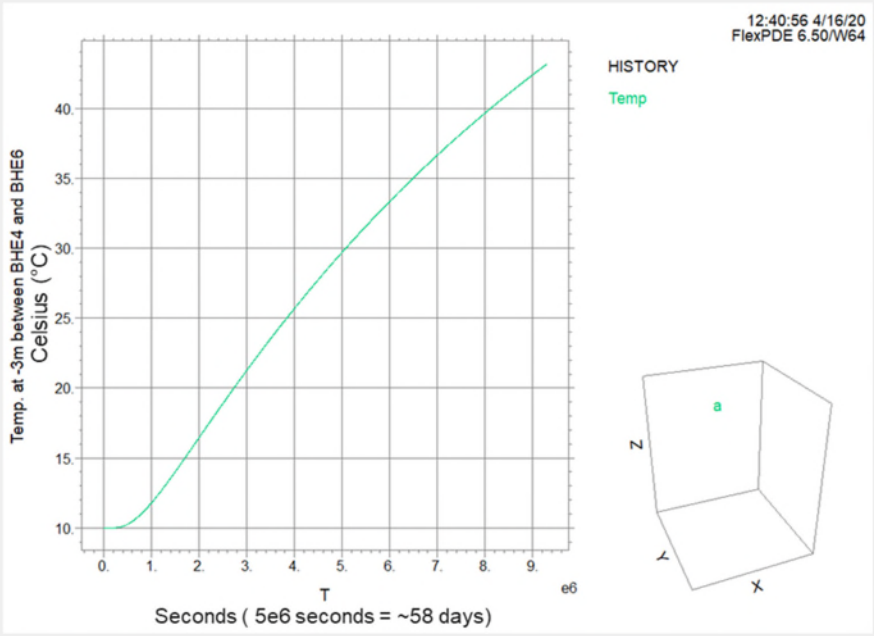
Results	Temperature profile at 9 feet (~3 m) below grade halfway between two BHE.
Target temperature of 40°C (~104°F) between BHE was achieved after 236 days.	

Figure D.5. 3-D Modeling Scenario 4

Modeling Scenario 1

Model Parameters	Top View
• 20 BHE • 20 feet (6 m) Spacing	
Results	Temperature profile at 9 feet (~3 m) below grade halfway between two BHE.
Target temperature of 40°C (~104°F) between BHE was achieved after 92 days.	

Based on the 3-D thermal modelling results, a BHE spacing of approximately 20 feet (6 m) was selected for the wellfield layout. Based on this configuration, the target temperature of 104°F (40°C) would be achieved in approximately 92 days.

Once the optimal BHE spacing was selected for the the wellfield layout, a wellfield layout of 30 BHE was established to address site-related impacts in the Building 55 area based on the results of historical investigations and the pre-design investigation activities. This anticipated 30 BHE wellfield layout was modelled to evaluate the wellfield performance. The 30 BHE wellfield layout was modelled using the thermal properties (e.g., thermal conductivities, heat capacities) and modelling setup (e.g., assumed geology, influent BHE temperature) described above; the new 3-D model domain consisted of an area of approximately 8,100 square feet (750 square meters). Temperatures were modelled at approximately 12 feet below grade to simulate the temperature profile at the anticipated depth at which thermocouple monitoring points will be placed in the BHE. The results of the 3-D model with the 30 BHE wellfield model layout after approximately one year of operations is shown on Figure D.6 below.

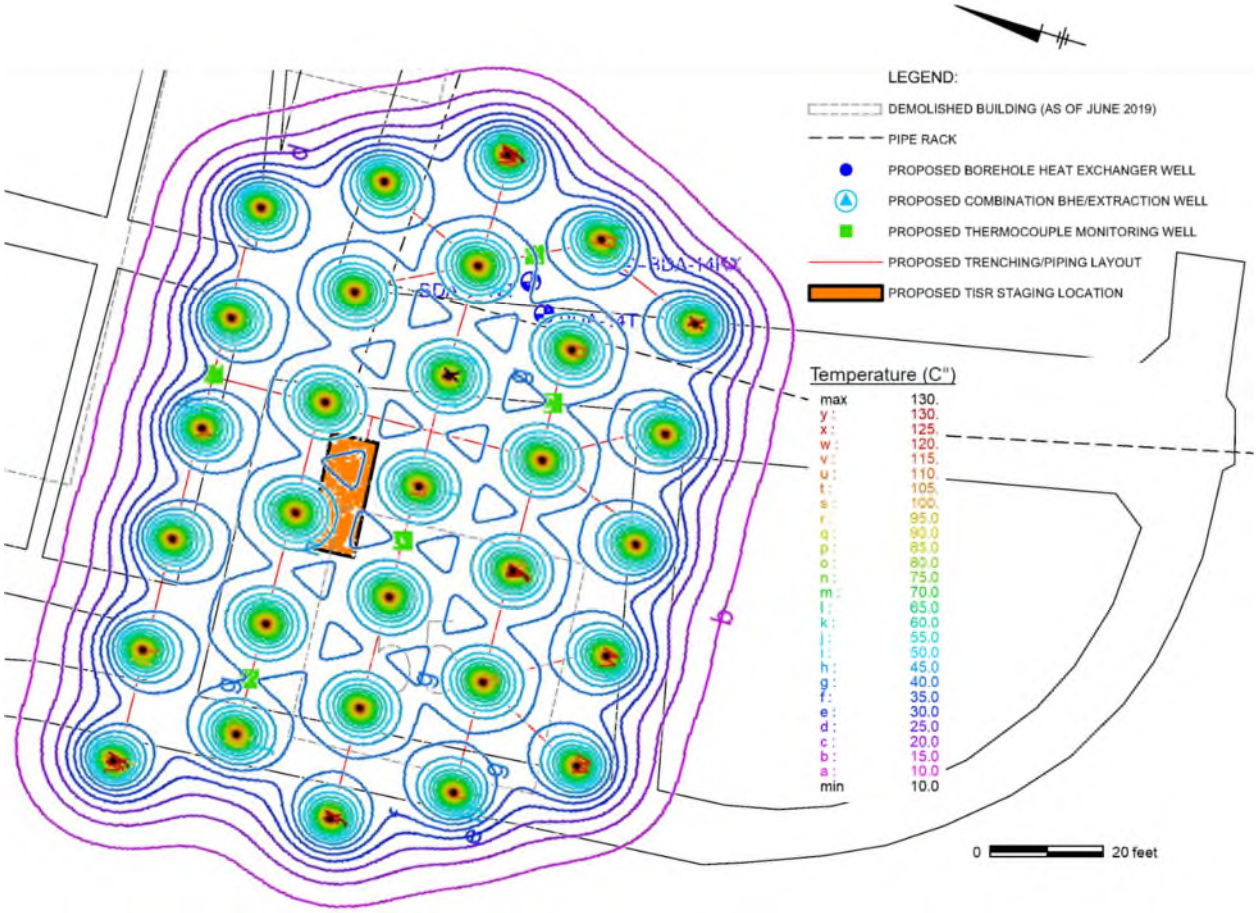


Figure D.6. 3-D Model with 30 BHE Wellfield Layout – Temperature Profile at 12 Feet Below Grade at Approximately 90 days

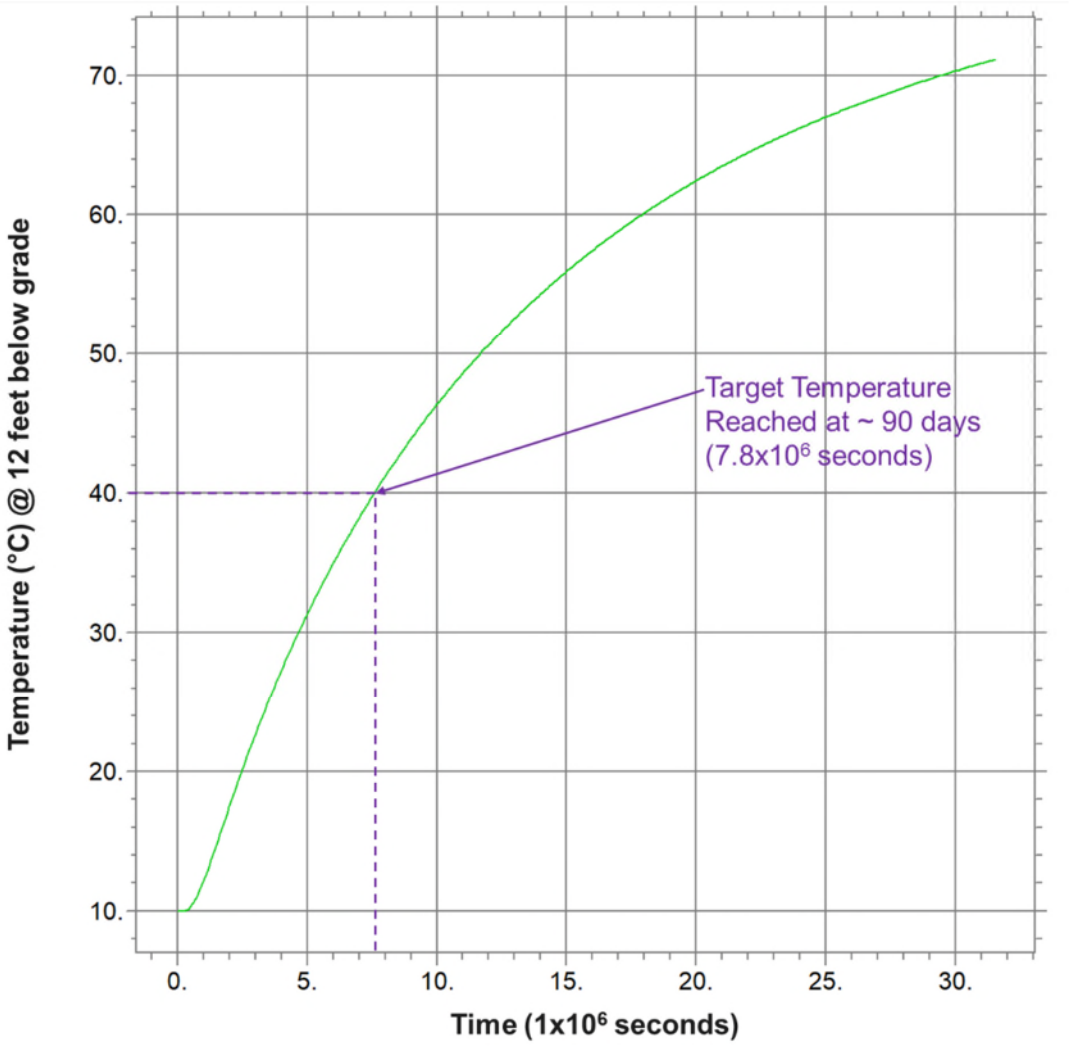


Figure C.7. Temperature profile at 12 feet (~4 m) below grade halfway between two BHE.

Based on the results of the 3-D model with the 30 BHE wellfield model layout, the target temperature of 104°F (40°C) would be achieved in between BHE (at the proposed thermocouple monitoring point locations) in approximately 90 days and would potentially increase to approximately 158°F (70°C) after approximately one year of operations (Figure D.7.) if left uncontrolled. However, the objective of the thermal model was to facilitate the selection of the appropriate spacing between BHE and to verify that target temperatures can be generally achieved within a reasonable timeframe. During operation, the TISR℠ system operational parameters will be monitored and adjusted to manage operational temperatures such that the target temperature range is between 30°C and 40°C (in between BHE).

Modeled temperatures do not account for vadose zone or surficial heat losses during winter and heat gains during summer or for the cooling effect of groundwater flowing through the treatment zone. Additionally, the model also does not account heat losses between the heat exchanger and BHE. Therefore, the modeling results should be considered as an estimate of heat transfer.

2-Model Domain

The 2-D model consisted of a horizontal cross section of a single BHE. Similar to the 3-D model, the BHE in the 2-D model was modeled in the (saturated) fine sand, silt, and clay unit (using the thermal properties summarized in Table A.1). Additionally, the influent temperature in the BHE was an assumed temperature of approximately 270°F (130°C). The 2-D model layout is shown on Figure D.8 below.

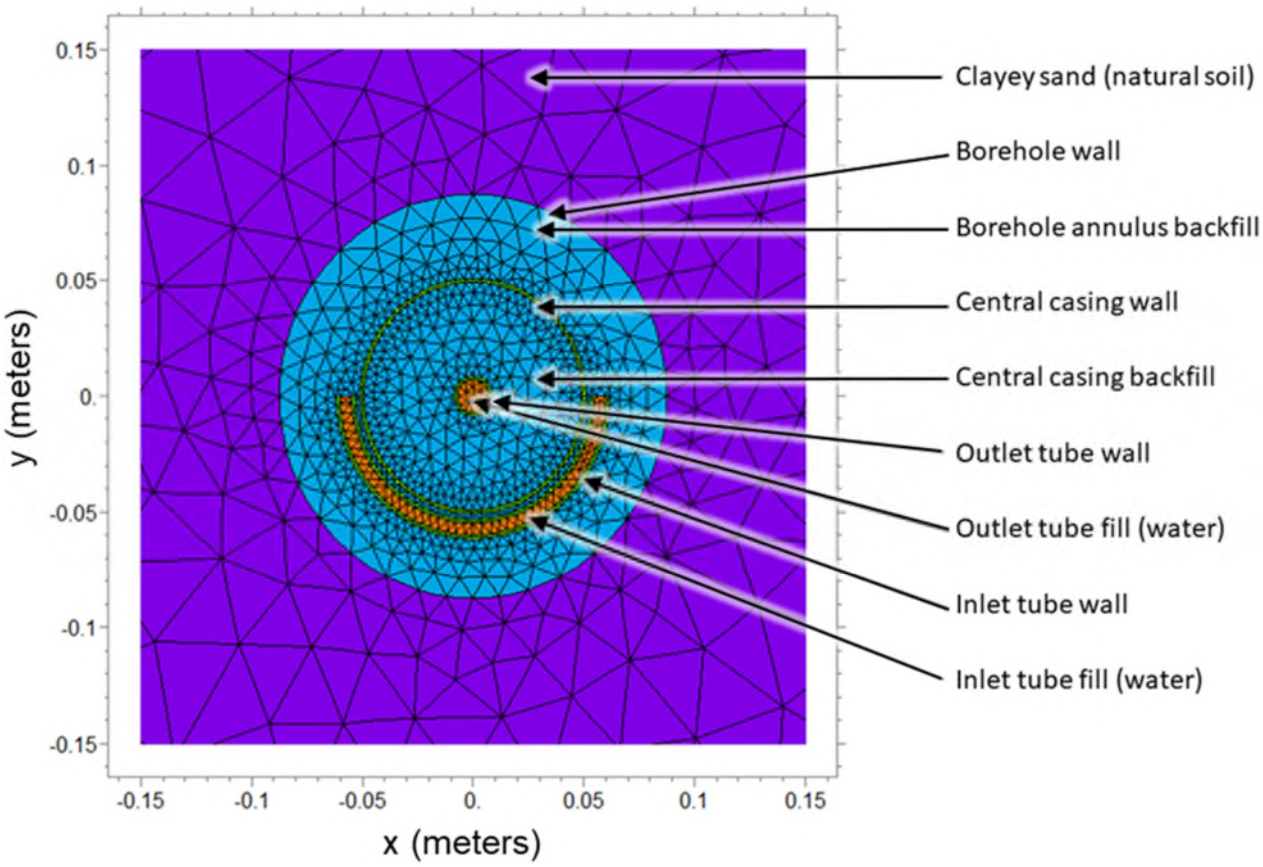


Figure C.8. 3 -D Model Layout

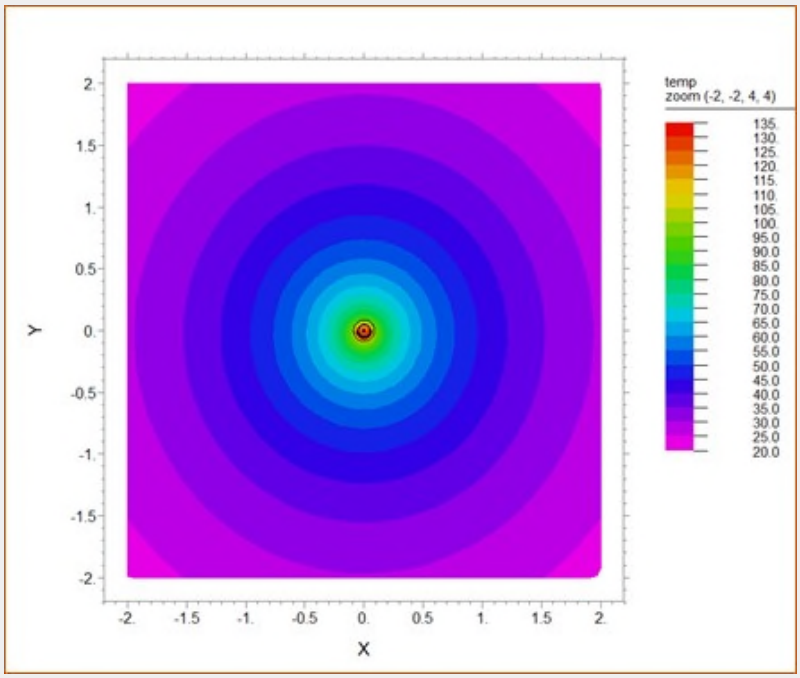
Several BHE casing diameters and construction materials were modeled, including:

- Coil Material: stainless steel vs. copper.
- Annulus fill materials: silica sand vs. thermal grout.
- BHE casing diameter: 2 vs. 4 vs. 6-inch outside diameter (OD).

The modelling results presented below assume a heating duration of 90 days.

Figure D.9. 2-D Modeling Scenario 1 (Stainless Steel vs. Copper)

Modeling Scenario 1

Model Parameters – Stainless Steel	Top View
• Casing Diameter: 4 inches • Coil Diameter: ¾ inch • Casing Material: stainless steel • Coil Material: stainless steel • Annulus Backfill: thermal grout	

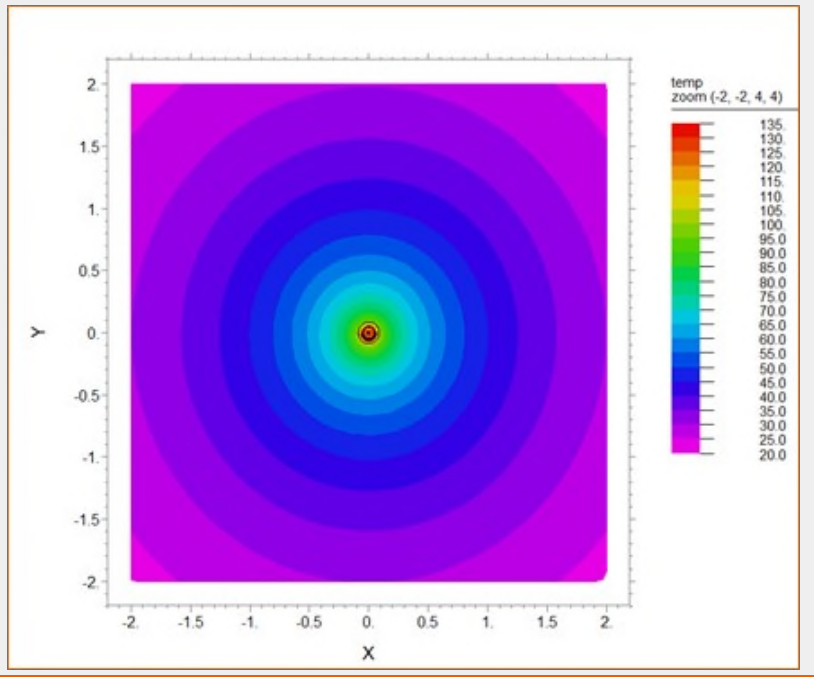
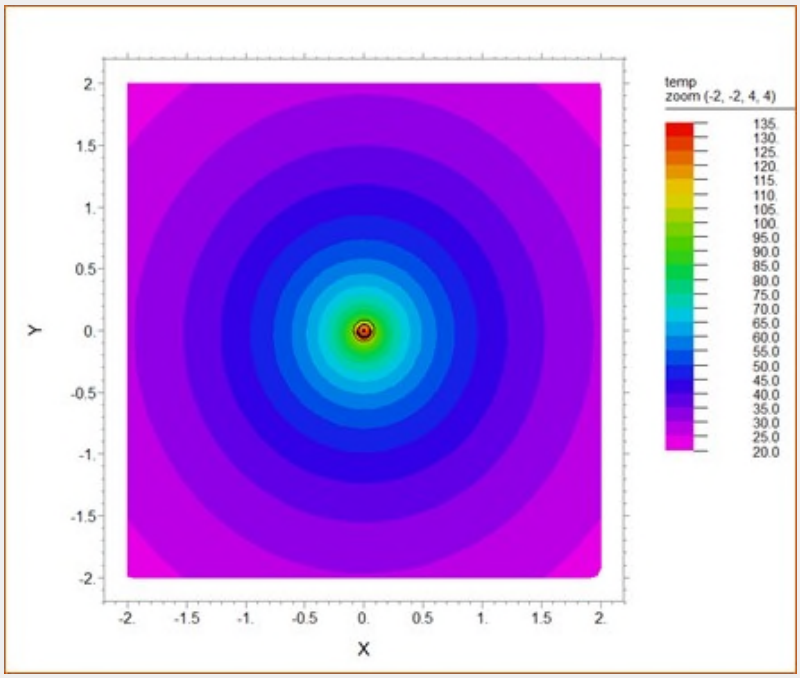
Model Parameters – Copper	Top View
• Casing Diameter: 4 inches • Coil Diameter: ¾ inch • Casing Material: copper • Coil Material: copper • Annulus Backfill: thermal grout	

Figure D.10. 2-D Modeling Scenario 2 (Thermal Grout vs. Silica Sand)

Modeling Scenario 1

Model Parameters – Thermal Grout	Top View
• Casing Diameter: 4 inches • Coil Diameter: ¾ inch • Casing Material: stainless steel • Coil Material: stainless steel • Annulus Backfill: thermal grout	

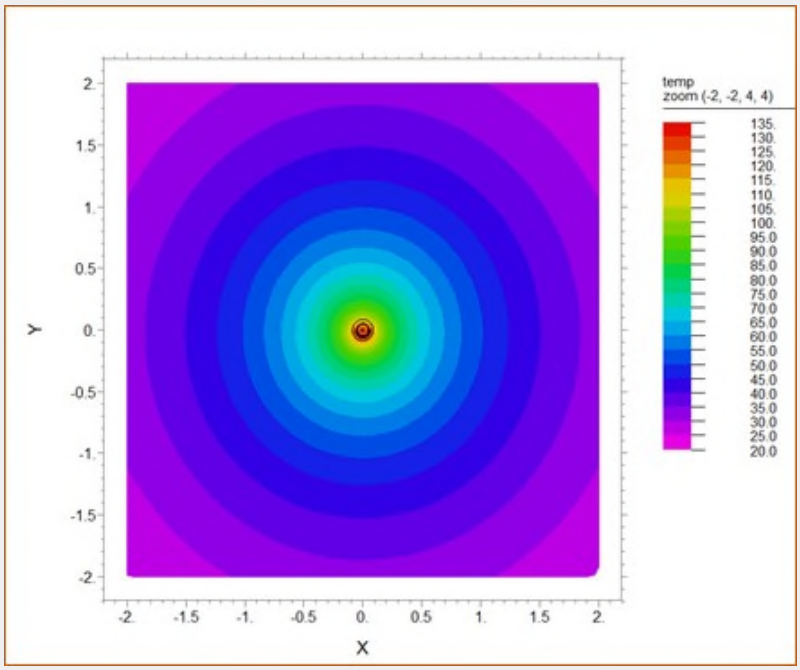
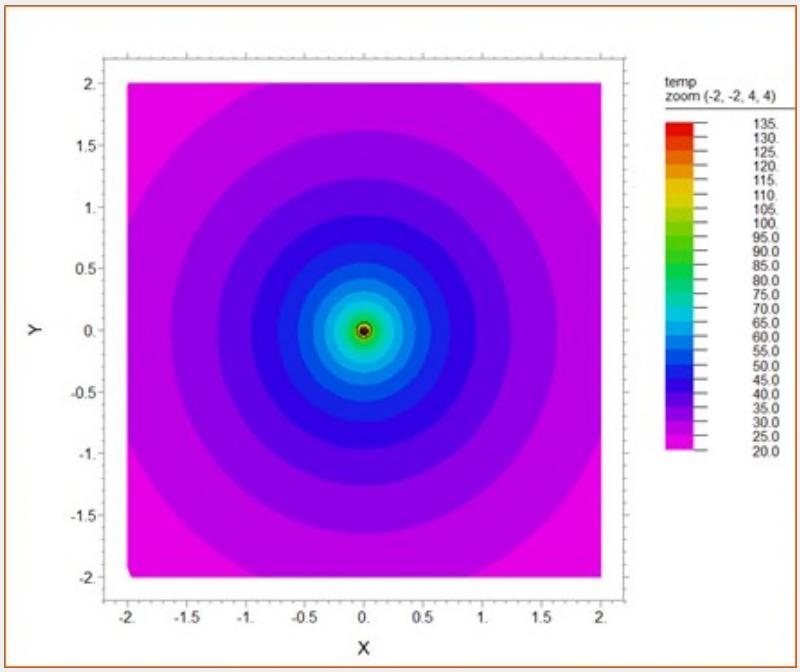
Model Parameters – Silica Sand	Top View
• Casing Diameter: 4 inches • Coil Diameter: ¾ inch • Casing Material: stainless steel • Coil Material: stainless steel • Annulus Backfill: silica sand	

Figure D.11. 2-D Modeling Scenario 3 (BHE casing diameter: 2 vs. 4-inch OD)

Modeling Scenario 1

Model Parameters – 2-inch OD	Top View
• Casing Diameter: 2 inches • Coil Diameter: ¾ inch • Casing Material: stainless steel • Coil Material: stainless steel • Annulus Backfill: thermal grout	

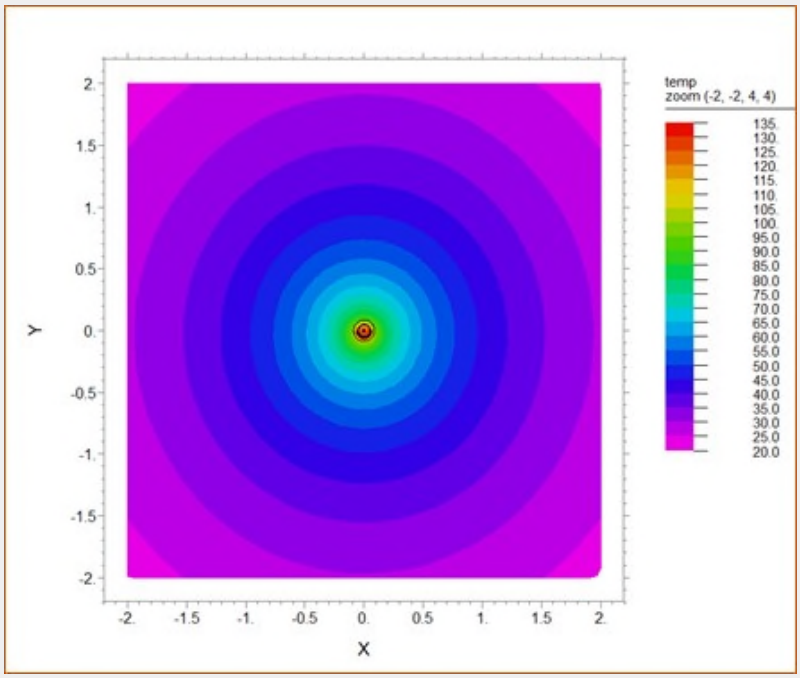
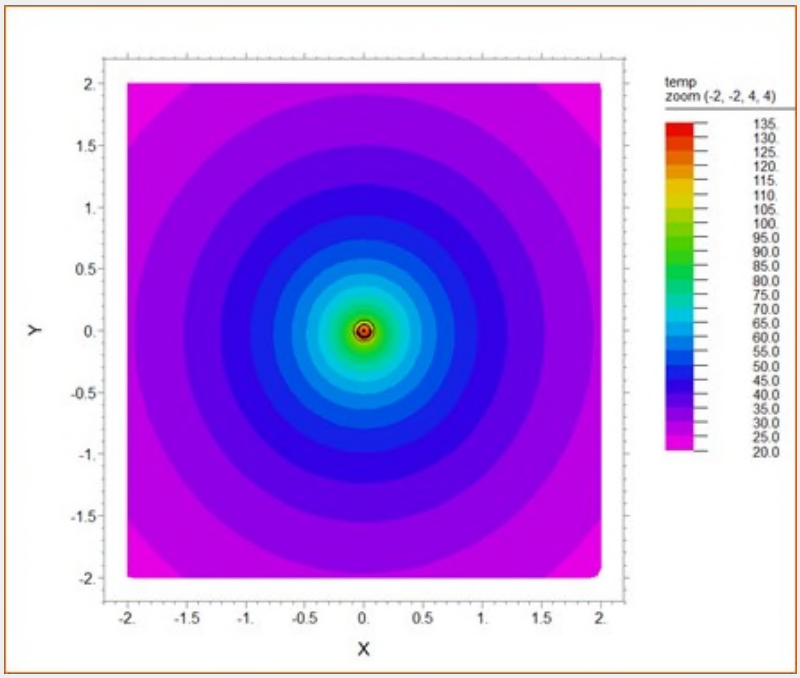
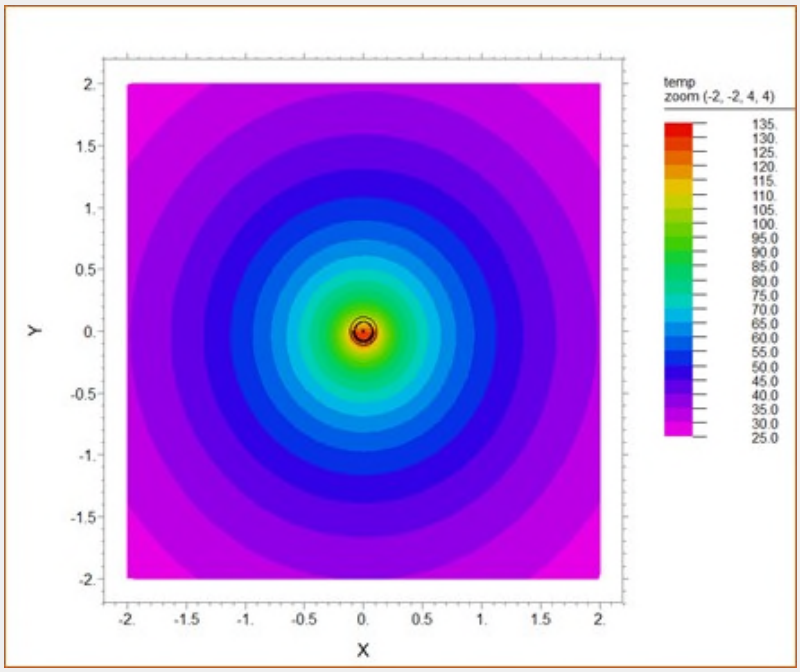
Model Parameters – 4-inch OD	Top View
• Casing Diameter: 4 inches • Coil Diameter: ¾ inch • Casing Material: stainless steel • Coil Material: stainless steel • Annulus Backfill: thermal grout	

Figure D.12. 2-D Modeling Scenario 4 (BHE casing diameter: 4 vs. 6-inch OD)

Modeling Scenario 1

Model Parameters – 4-inch OD	Top View
• Casing Diameter: 4 inches • Coil Diameter: ¾ inch • Casing Material: stainless steel • Coil Material: stainless steel • Annulus Backfill: thermal grout	

Model Parameters – 6-inch OD	Top View
• Casing Diameter: 6 inches • Coil Diameter: ¾ inch • Casing Material: stainless steel • Coil Material: stainless steel • Annulus Backfill: thermal grout	

Generally, materials with higher thermal conductivities (such as copper and silica sand) or a larger BHE casing diameter would allow for a more efficient heat transfer from the BHE to the surrounding formation during a transient state. Therefore, heating would occur relatively faster at a given distance from the BHE. However, once equilibrium is attained in a steady state, the difference between using one modeled material vs. a different modeled material for the construction of the BHE (e.g., copper vs. stainless-steel, silica sand vs. thermal grout, or 2 vs. 4 vs. 6-inch OD diameter) would be less significant, especially considering that the 2-D model does not account for the overlying and underlying model-layers and interference with the nearby BHE as in the 3-D model.

Therefore, considering the BHE spacing, the heat available, the target temperature, and that the remedial activities are expected to be completed within three years, the 2-D modeling results indicated that the BHE coil material, annulus fill material, and BHE casing diameter had little influence on the heat transfer effectiveness. The modeling showed that the different configurations obtained the target temperature and distances within a few days of each other. Therefore, the BHE is expected to be constructed as using the following materials:

- Stainless steel coil, as stainless steel would be more cost effective compared to copper.
- Thermal grout to fill the annulus space between the casing and the native material, as thermal grout would protect the casing from potential environmental corrosion.
- A casing diameter of 4 inches OD to facilitate the construction of the BHE, as using 2-inch OD casing would potentially compromise the structural integrity of the coil (e.g., breakage, kinking) and using a 4-inch OD casing would be more cost effective than using a 6-inch OD casing.

References

VDI. 2000. Thermische Nutzung des Untergrundes, Richtlinie VDI 4640, Blatt 1 – Grundlagen, Genehmigungen, Umweltaspekte. Beuth Verlag, Berlin. Dezember.

APPENDIX E

Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN
BMS SYRACUSE NORTH CAMPUS RESTORATION AREA

INTRODUCTION

The currently ongoing Syracuse Facilities Transformation Project will remove idle buildings and equipment, demolish the vacant obsolete manufacturing buildings and transform the Bristol-Myers Squibb Syracuse Site into a "penicillin-free" pharmaceutical facility. Site preparation has begun, and actual demolition began in 2011 and is expected to conclude in the first half of 2013.

In addition to the Transformation Project, BMS has entered a portion of its facility into the New York State Brownfield Cleanup Program (BCP). The BCP Agreement was effective on October 18, 2011, and the Brownfield Area is shown on Figure 1. Following completion of the current phase of the Transformation Project, six major "non-pen" buildings will remain in use on the Brownfield Area, and the remainder of the area will be transformed to an attractive "park-like" campus to enhance the continuing operating facility.

The Remedial Investigation (RI) under the BCP is expected to be initiated during 2013, following completion of the current phase of the Transformation Project.

OBJECTIVES AND AIR MONITORING APPROACH

This Community Air Monitoring Plan (CAMP) has been developed to describe air monitoring to be implemented during ground-intrusive activities associated with the Brownfield RI and Transformation Projects within the Brownfield Area.

Based on investigations completed to date, volatile organic compounds (VOCs) have been detected in the soil and groundwater in limited areas within the Brownfield Area. The VOCs found most frequently are methylene chloride and methyl isobutyl ketone (MIBK).

Ground-intrusive activities within the Brownfield Area will consist of the following:

- Excavations ranging from small diameter boreholes to removal of building slabs and large areas of asphalt associated with the Transformation Project.
- Advancement of soil borings and installation of monitoring wells associated with the Brownfield Project RI.

Air monitoring will assess potential air quality impacts from VOCs and particulates (dust) to the surrounding community and site workers/visitors present on the BMS facility but outside of the Brownfield Area. The air monitoring program described herein was developed using the New York State Department of Health (NYSDOH). Generic Community Air Monitoring Plan (gCAMP) guidance for evaluation of potential airborne contaminant releases as a direct result of construction and investigative work activities[1].

COMMUNITY RECEPTORS

Except for the Thompson Road boundary, property immediately adjacent to the Brownfield Area is owned by BMS. Figure 2, Land Use, shows the current land use for properties surrounding the Brownfield Area.

[1] New York State Department of Environmental Conservation, Division of Environmental Remediation, DER-10/Technical Guidance for Site Investigation and Remediation (Appendix 1A - Generic Community Air Monitoring Plan, New York State Department of Health and Appendix 1B - Fugitive Dust and Particulate Monitoring), May 2010.

Thompson Road borders the Brownfield Area to the west. Beyond Thompson Road is a residential neighborhood. None of the residential properties face on Thompson Road. South of the residential neighborhood on the corner of Burnet Avenue and Thompson Road is an automobile dealership/body shop.

To the north, proceeding clockwise from Thompson Road and beyond the adjacent BMS property, the next adjacent landowner is CSX Corporation (CSX) which holds title to the railroad right-of-way. Beyond CSX's property, is a supermarket, followed by James Street. Land use on the opposite side of James Street is primarily commercial and light industrial.

The CSX right-of-way continues along the northeast boundary of the BMS property. Beyond the CSX right-of-way, proceeding further to the east is a series of light industrial and commercial facilities and several residences located on the west side of West Manlius Street. On the east side of West Manlius Street, there is a mix of commercial and residential properties. Proceeding toward the southeast along this BMS property line, the non-Brownfield BMS property provides a progressively wider buffer with non-BMS adjacent properties.

To the south, beyond a substantial buffer of non-Brownfield BMS property, Bristol-Myers Squibb's main campus facility is bounded by Burnet Avenue. Beyond Burnet Avenue, there are light industrial and commercial facilities, as well as additional BMS property, including the wastewater pretreatment plant. Beyond that is the I-690 corridor.

AIR MONITORING OVERVIEW

As outlined in the gCAMP guidance, the air monitoring program will include monitoring for particulate and VOCs. Particulate monitoring will consist of continuous real-time air monitoring of particulate matter less than 10 micrometers (PM_{10}) in diameter upwind and downwind of the work site during daily ground-intrusive activities. VOC monitoring will consist of continuous real-time air monitoring of total VOCs (TVOCs) at a minimum of one upwind location and one downwind location during daily ground-intrusive activities using a real-time TVOC meter.

AIR MONITORING EQUIPMENT

Equipment to be used for the air monitoring program will be as follows:

- Dust meter capable of detecting particulate matter less than PM_{10} in diameter – TSI DustTRAK, Thermo Fisher DataRam, or similar. The DustTRAK and DataRam meters are photometric light-scattering instrument that continuously measure airborne particulate concentrations from 0.1 micrograms per cubic meter ($\mu g/m^3$) to greater than 100 milligrams per cubic meter (mg/m^3) and record the results in time-weighted average (TWA) concentrations that can be set by the operator.
- Photoionization detector (PID) equipped with an 11.7eV (or higher) lamp to monitor for VOCs (MiniRAE 2000 or similar) equipped with data logging capabilities and alarm functions. The MiniRAE 2000 is a UV-light photoionizing detector (PID) that continuously measures TVOC concentrations from 0.1 to 10,000 parts per million (ppm), and records the results in TWA concentrations that can be set by the operator.
- 5 ppm isobutylene calibration gas cylinders for daily PID calibration.
- Tripod with Environmental Enclosure and a signal light, audible alarm and/or pager for each monitoring station.
- Flagging or similar material to be used to assess wind direction in the vicinity of the field activity.

Manufacturers' cut sheets for representative particulate and VOC monitoring instruments that may be utilized during the CAMP implementation are provided in Attachment 1.

AIR MONITORING LOCATIONS

The number of air monitoring locations used will depend on how many work areas are active at a particular time, the areal extent of those work areas, and the presence of buildings that may locally influence prevailing wind directions. For the purpose of this CAMP, except to the extent that the location is not accessible, the downwind perimeter of the work area is defined as a distance of 200 ft from the open excavation or boring or the boundary of the Brownfield Area, whichever is closer. When a location is not accessible, an alternate location will be selected based on good engineering judgment and NYSDEC will be informed. Equipment requirements are as follows:

- An upwind monitoring station consisting of one VOC and one particulate (dust) meter shall be placed in a location that is out of the influence of the work area(s). If offsite activities are occurring that may contribute to air quality (particulate or VOCs) upwind of the work area(s) the upwind monitoring station should be placed at a location between that source and the work area(s).
- For work areas consisting of individual excavations with total open area of less than 500 square feet (ft^2) or individual or closely grouped borings, air monitoring will be conducted using one VOC and particulate monitoring station located at the perimeter of the work area. If the Brownfield Area perimeter boundary lies within 200-ft of the work area(s), then downwind air monitoring are expected to be conducted at the Brownfield Area perimeter boundary.
- For work areas consisting of excavations or removals that are greater than 500 ft^2 of open area or multiple borings that are spread out, air monitoring will be conducted using one or more downwind VOC and particulate monitoring stations. The number of downwind VOC and particulate monitoring stations required to effectively monitor air quality will be based on the size and orientation of the work area(s) relative to the prevailing wind direction.
- Site wind conditions will be evaluated for each work area. The prevailing wind direction will visually monitored by using the wind sock present on top of Building 25. In addition, a flag will be affixed to the excavating and/or drilling equipment to assess local variations that may result from the presence of on-site structures.
- The number and location of air monitoring stations will be selected at the beginning of each work day by the air monitoring technician based on the extent and orientation of the work area(s) relative to the prevailing wind direction. Air monitoring stations will be relocated as necessary during the work day if the work area changes and/or the prevailing wind direction changes.
- Particulate monitoring will not be conducted during periods of rain or heavy snow since water entering the sample inlet may damage the analyzer.

PARTICULATE MONITORING

The monitoring approach and action criteria described below are based on guidance contained in the NYSDOH gCAMP. Accordingly, action levels for particulates, discussed below, are based on 15-minute TWA concentrations. Each downwind dust meter will be programmed to set off an alarm and alert the on-site air monitoring technician (either visual or audible alarm, or via radio or cellular pager) when instantaneous particulate levels are greater than 100 $\mu g/m^3$. When alerted to an alarm, the monitoring technician will mobilize to the monitoring station indicating the alarm condition. The technician will evaluate the instantaneous dust meter readings to evaluate whether they are trending upward or downward and sustained above the 100 $\mu g/m^3$ over the 15-minute period. In addition, the technician will compare the downwind 15-minute TWA particulate readings to the upwind 15-minute TWA particulate readings to evaluate whether a corrective response is required.

Action criteria and corrective responses will be as follows:

- If the downwind 15-minute TWA particulate level is 100 µg/m^3 above the upwind 15-minute TWA particulate level, or if visible airborne dust is observed leaving the site perimeter, then dust suppression techniques must be employed by the excavation and/or drilling contractor. Work may continue with dust suppression techniques provided that downwind 15-minute TWA particulate levels do not exceed 150 µg/m^3 above the upwind 15-minute TWA particulate level, and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, the downwind 15-minute TWA particulate levels are greater than 150 µg/m^3 above the upwind 15-minute TWA particulate levels, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and/or other controls are successful in reducing the downwind particulate concentration to less than 150 µg/m^3 of the upwind level and in preventing migration of visible dust off-site.

VOC MONITORING

The monitoring approach and action criteria described below will be based on guidance contained in the NYSDOH gCAMP. Accordingly, action levels for TVOCs, discussed below, are based on 15-minute TWA concentrations. Each downwind VOC monitor will be programmed to set off an alarm and alert the on-site air monitoring technician (either visual or audible alarm, or via radio or cellular pager) when instantaneous downwind TVOC levels are greater than 5 parts per million (ppm). When alerted to an alarm, the monitoring technician will mobilize to the monitoring station indicating the alarm condition. The technician will review the instantaneous TVOC readings to evaluate whether they are trending upward or downward and sustained over a 15-minute period. In addition, the technician will compare the downwind 15-minute TWA TVOC readings to the upwind 15-minute TWA TVOC reading to evaluate whether corrective response is required.

With the exception of two areas on the Brownfield (Building 25 complex and Building 45), VOC monitoring will be conducted using a PID equipped with an 11.7 eV lamp. When working in the Building 25 complex and Building 45 area, a flame ionization detector (FID) will be used in conjunction with the PID in the breathing zone of the workers in the exclusion zone to allow for detection of acetonitrile. Acetonitrile, which has an ionization potential of 12.2eV, was used within the Building 25 complex and stored in Building 45, and was transferred between these two locations via overhead piping. The Permissible Exposure Limit (PEL) for acetonitrile is 40 ppm. The response factor of the FID for acetonitrile is 1. Should the FID reading be 25 ppm above background in the breathing zone, the FID will be moved to the downwind monitoring location and used to monitor ambient air concentrations for 15 minutes.

Action criteria and corrective responses for the PID and FID, if used, will be as follows:

- If the 15-minute TWA ambient air concentration of TVOCs at the downwind monitoring station(s) monitors exceeds 5 ppm above the upwind monitoring station for the 15-minute TWA, work activities must be temporarily halted and monitoring continued. If the downwind TVOC level readily decreases (per instantaneous readings) to less than 5 ppm above the upwind level, work activities can resume with continued monitoring.
- If the downwind 15-minute TWA TVOC levels persist in excess of 5 ppm above the upwind level, but are less than 25 ppm above the upwind level, work activities must be discontinued until the source of vapors have been identified, and controls/countermeasures have been taken to abate emissions. During the discontinuation of work, air monitoring will continue to be conducted. After these steps, work activities can resume provided that the TVOC levels at the downwind monitoring station(s) located 200-ft downwind of the work area(s), or half the distance to the nearest potential receptor or residential/commercial structure (but in no case less than 20 feet) is less than 5 ppm above the upwind station for the 15-minute TWA.

- If the 15-minute TWA TVOC level is above 25 ppm at the downwind monitoring station(s), ground-intrusive activities must be shut down until an effective means of suppression of VOCs can be developed.

CONTROL MEASURES

If the air monitoring indicates that either dust control measures, vapor control measures, or both measures are required, these measures will be implemented by the excavation and/or drilling contractor in accordance their dust control plan and/or vapor control plan. Typical dust control measures include the use of water or mist fences. Procedures to control VOC emissions include minimizing the amount of excavation area open at any one time by covering portions of the excavation area with plastic sheeting, soil or foam.

QUALITY CONTROL AND QUALITY ASSURANCE

Zero and span calibration checks for VOC meters will be conducted by the air monitoring technician at the beginning of each day following applicable manufacturer's calibration guidelines. Zero calibration checks for the dust meters will be performed on the first day of each monitoring week by the air monitoring technician following applicable manufacturer's calibration guidelines. A Daily Field Calibration Form is provided in Attachment 2.

Records of daily field activities, summary of daily air quality measurements, and documentation of general observations, notes, and control measures implemented, if any, will be documented on an Air Quality Monitoring Daily Summary log. In the event that an alarm is triggered for reasons not directly associated with releases from ground-intrusive activities (e.g. exhaust or particulates from vehicles passing the monitoring station) this information will also be documented on the Air Quality Monitoring Daily Summary log. An example of the Air Quality Monitoring Daily Summary log is provided in Attachment 3.

Should wind direction change during ground-intrusive work, the air monitoring technician will evaluate the need to re-position the air monitoring stations. If an air monitoring station is re-positioned, the air monitoring technician will document this on the Air Quality Monitoring Daily Summary log.

DATA MANAGEMENT AND REPORTING

Data will be manually downloaded to a laptop computer at the end of each day. A separate electronic file folder will be established for each day of activity. Background levels, exceedances of action levels, and a summary of response actions taken as recorded on the Air Quality Monitoring Daily Summary logs will be stored electronically with the data downloads. The data and the field logs will be retained by BMS and will be transmitted to the State (NYSDEC and NYSDOH) upon request.

PATH: I:\Bms 2874\STDS\GIS\Syracuse\MXD\RIWP\Figure_1_BrownfieldArea_11x17.mxd

FIGURE 1



LEGEND

- BROOK / CREEK
- BROWNFIELD AREA

STATUS AFTER TRANSFORMATION

- BUILDING TO REMAIN
- BUILDING REMOVED

BRISTOL-MYERS SQUIBB
SYRACUSE, NEW YORK

BROWNFIELD AREA

0 100 200 400
Feet

FEBRUARY 2012
2874

O'BRIEN & GERE

This document was developed in color. Reproduction in B/W may not represent the data as intended.

DATE: 2/6/2012 1:30:24 PM NAME: KellyBA

I:\Bms_2874\STDS\GIS\Syracuse\MXD\LAND_USE_PreBMS_2.mxd

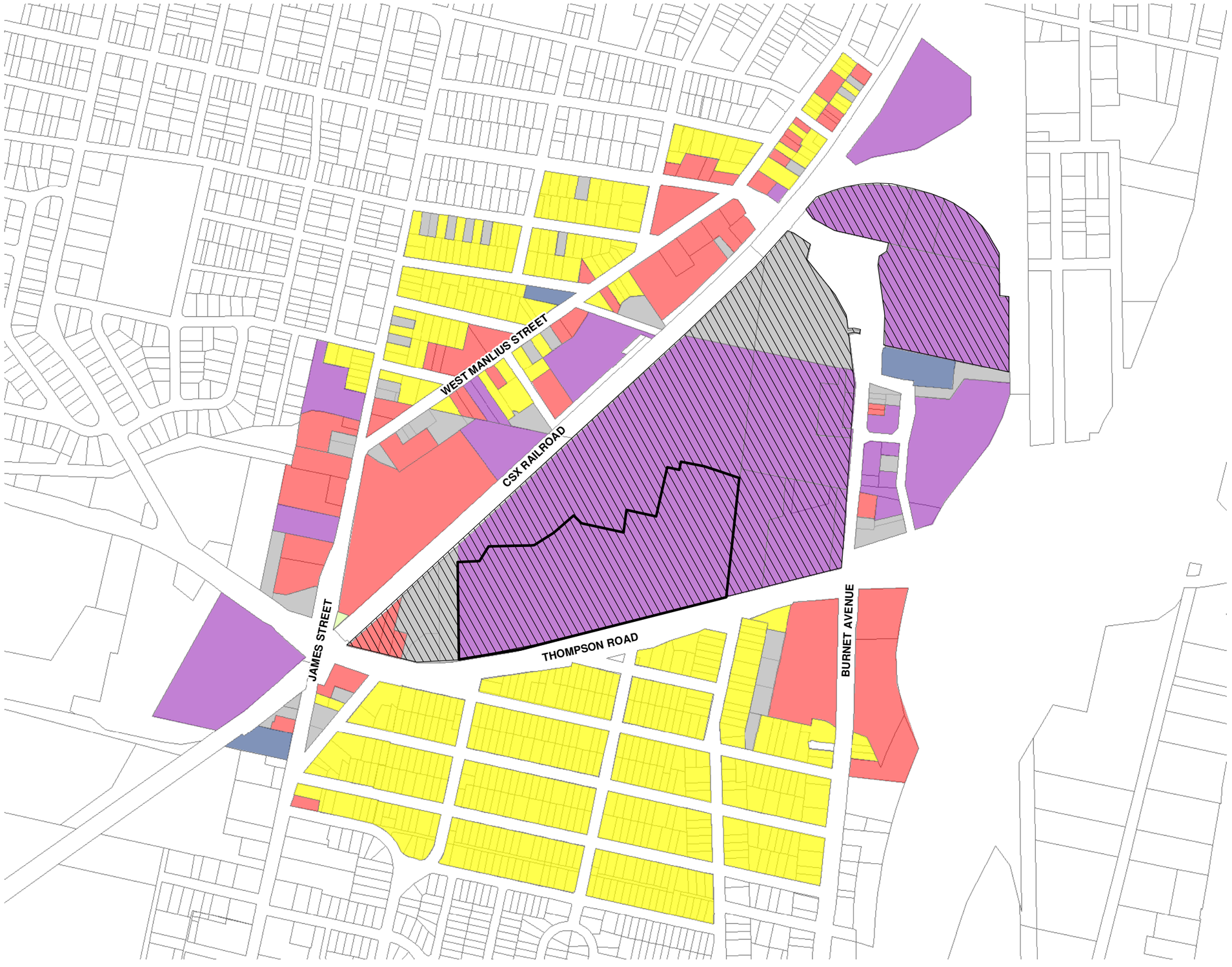


FIGURE 2

LEGEND

- BMS PROPERTY
- BROWNFIELD AREA BOUNDARY
- UNDETERMINED PROPERTY
- PUBLIC SERVICE PROPERTY
- VACANT PROPERTY
- INDUSTRIAL PROPERTY
- RESIDENTIAL PROPERTY
- COMMERCIAL PROPERTY

NOTE: SOURCE OF PROPERTY INFORMATION IS FROM SYRACUSE-ONONDAGA COUNTY G.I.S. ON THE WEB www.maphost.com/syracuse-onondaga

PARCEL INFORMATION ASSOCIATED WITH THE BMS FACILITY HAS BEEN UPDATED TO REFLECT CURRENT USE

BRISTOL-MYERS SQUIBB
SYRACUSE, NEW YORK

LAND USE

0 275 550 1,100
Feet

SEPTEMBER 2011
2874.47694

O'BRIEN & GERE

PLOTDATE: 09/12/11 2:41:27 PM CarnevDJ

This document was developed in color. Reproduction in B/W may not represent the data as intended.

Dust and VOC Monitoring Instruments – Manufacturers' Information



DataRAM 4™ - Model DR-4000

Portable particle sizing aerosol monitor/data logger Dual Wavelength Nephelometer

Real-time airborne particulate concentration and size measurements

The DataRAM 4™ (Model DR-4000) continuously monitors the real-time concentration and median particle size of airborne dust, smoke, mist, and fumes. In addition, air temperature and humidity are displayed. With appropriate particle discriminators it provides measurements correlated with PM10, PM2.5, PM1.0, and respirable fractions. It's patented two-wavelength particle detection system provides the volume median particle diameter of the sampled aerosol, over a concentration range of up to 400 mg/m^3. Unlike typical particle counting devices, the DR-4000 is totally immune to particle coincidence errors, even at the highest concentrations. Volume median particle sizes down to 0.05 µm can be measured by this unique spectral nephelometric technique.

Monitors mass concentrations of fine particulate (PM 2.5)

The DR-4000 monitors the concentrations of fine particulates in ambient air by a combination of aerodynamic size preselection, two-wavelength nephelometry, and concurrent sensing/correction for relative humidity. This patented technique provides a continuous measurement of PM2.5, independent of particle size and moisture - *without heating, diffusion drying, or denuding the sample stream*.

Measure scattering, angstrom coefficients, and visual range

DR-4000 measures the scattering coefficient at two wavelengths (in units of inverse megameters) and computes the coefficient at the reference wavelength of 550 nanometers, as well as the angstrom exponent (a measure of atmospheric fine particle size). Based on the 550 nm scattering coefficient, the instrument then calculates the visual range in kilometers.

Complete digital communications

The DR-4000 has both RS232 and RS485 data ports for two-way digital communications. Special, Windows™ compatible software (provided with the instrument) facilitates data transfer either in real-time or from the logged memory. All operational and programming functions can be controlled from a remote location through the RS485 communications port. Sampling start and stop as well as data transfer can be controlled via modem or other digital transmission paths.

Self-calibrating internal filter

A 37 mm membrane filter (adapter provided) can be used in place of the zeroing HEPA filter cartridge for gravimetric calibration and/or chemical analysis of collected particulates. The DR-4000 is easily calibrated by adjusting the calibration constant to agree with gravimetric measurements obtained from the on-board filter. As the photometric response of the instrument is exactly linear over its entire operating range, only single point gravimetric calibration is needed. The second point of the straight response line is the zero concentration obtained by self-purging.

Expandable to a complete characterization system

A variety of accessories extend the capabilities of the DR-4000 to serve a wide range of monitoring and sizing applications. Aerodynamic particle size separators measure specific size groups such as the thoracic, respirable, PM10, PM2.5, and PM1.0 fractions. An omnidirectional sampling inlet and an in-line mist and fog elimination heater are available for ambient air monitoring. An isokinetic sampling probe/nozzle kit enables duct/stack monitoring.

DataRAM 4™ - Model DR-4000

Portable particle sizing aerosol monitor/data logger
Dual Wavelength Nephelometer

Specifications

Concentration measurement range (auto-ranging):
Referred to gravimetric reference calibration (NIST traceable)
with SAE Fine test dust (mmd = 2 to 3 µm, σ_g = 2.5, as aerosolized)
0.0001 to 400 mg/m^3

Precision/repeatability (2-sigma):
At 25˚C
For single-wavelength concentration sensing
± 1% of reading or ± 0.001 mg/m^3, whichever is greater (1-second averaging)
± 0.3% of reading or ± 0.0003 mg/m^3, whichever is greater (10-second averaging)

Accuracy:
Referred to gravimetric reference calibration (NIST traceable)
with SAE Fine test dust (mmd = 2 to 3 µm, σ_g = 2.5, as aerosolized)
± 2% of reading ± precision

Resolution:
0.1% of reading or 0.0001 mg/m^3, whichever is greater

Scattering coefficient range:
10^{-7} to 0.4 m^{-1} (resolution: 3 significant digits, maximum)

Visual range (@λ= 550 nm):
0.001 to 337 km (resolution: 3 significant digits, maximum)

Ångström coefficient measurement range:
0.0 to 4.0

Particle sizing range (log-normal, σ_g = 2.0, m = 1.50):
0.05 to 4 µm

Particle size range of maximum response (concentration measurements):
0.08 to 10 µm

Temperature measurement range:
5˚F to 140˚F (-15˚C to 60˚C); accuracy: 0.05˚C

Relative humidity measurement range (@ 25˚F):
0 to 100% (accuracy: 2%, noncondensing)

Sampling flow rate range (user selectable):
1.0 to 3.0 liters/min.
(accuracy: 0.05 liters/min., adjustability: 0.1 liters/min.)

Measurement/display integration time range *(user selectable)*:
1 to 60 sec. (selectable in 1-sec. steps)

Measurement/display update frequency:
1 per sec.

HEPA filter cartridge replacement frequency (typical):
Less than 1 per 5 yrs (@ ‹ 1 mg/m^3)

Alarm level range *(user selectable)*:
Selectable over entire measurement range

Data logging averaging periods *(user selectable)*:
1 sec. to 24 hrs (selectable in 1-sec. increments)

Data logging memory capacity:
50,000 data points in up to 99 tags (data groups)

Programmable zeroing periods *(user selectable)*:
1 to 168 hrs (selectable in 1-hr increments; if enabled, logging period must be more than 10 min.)

Elapsed time readout range:
1 sec. to 100,000 hrs (over 11 yrs), in sec., min., and hrs

Digital communications:
RS232/RS485: full duplex, 9600 baud, software-controlled, device-filtered

Computer requirements:
IBM-compatible PC, Windows™ 95 or higher; 8 MB memory or more

Analog outputs *(user selectable)*:
0 to 5 V and 4 to 20 mA, with selectable full scale ranges between 0.1 and 400 mg/m^3

Power:
- Internal battery: rechargeable, sealed lead-acid, 6.5 Ahr, 6 V, 20-hr run time between charges (typical)
- AC line: universal voltage charger/power supply (included), 100-250 V, 50-60 Hz (CE marked)
- Optional solar power system (Model DR-SOL)

Alarm outputs:
- Alarm switch: 30 V (off, open), 2.5 A (on, closed)
- Alarm signal: 0 V (off), 5 V (on) (1 mA maximum load current)
- Audio alarm (back panel): More than 65 dB @ 1 m

Operating environment:
14˚F to 122˚F (-10˚C to 50˚C); 10 to 95% RH, noncondensing

Storage environment:
- 4˚F to 158˚F (-20˚C to 70˚C)

Dimensions:
5.28 in. (134 mm) H x 7.25 in. (184 mm) W x 13.63 in. (346 mm) D

Weight:
11.7 lbs (5.3 kg)

Safety approvals and certifications:
The DataRAM 4 complies with US FCC rules (Part 15) and has received CE certification.

Standard accessories included:
- Universal voltage battery charger/power supply
- Standard HEPA filter cartridge
- Analytical filter holder
- PC communications software disk
- Digital output cable
- Carrying case and instruction manual

500 Technology Court Smyrna, GA 30082
800-241-6898 (toll free in USA) ■ 770-319-9999 (outside USA) ■ 770-319-0336 (fax)
www.thermoandersen.com ■ sales@thermoandersen.com

The Thermo Anderson logo. All other product names and logos are the property of their respective owner. Specifications and availability subject to change without notice. © Thermo Anderson 06/17/02

DUSTTRAK™ Aerosol Monitor

The DUSTTRAK™ Aerosol Monitor measures aerosols in a wide variety of environments, from offices and industrial workplaces to outdoor environmental and construction sites. TSI's DUSTTRAK provides reliable exposure assessment by measuring particle concentrations corresponding to PM10, PM2.5, PM1.0 or respirable size fractions.

The DUSTTRAK is a portable, battery-operated laser photometer which gives you a real-time digital readout with the added benefits of a built-in data logger. Suitable for clean office settings as well as harsh industrial workplaces and outdoor applications, the DUSTTRAK detects potential problems with airborne contaminants such as dust, smokes, fumes and mists.

The DUSTTRAK is easy to use, too. You can perform quick spot checks or you can program the advanced logging modes for long-term sampling. You can program the start/stop times, recording intervals and other parameters. You can even set up the instrument for continuous unattended operation.

The DUSTTRAK's new continuous analog output and adjustable alarm output allow remote access to real-time particle concentration data. Applications include site perimeter monitoring, ambient monitoring, process area monitoring and other remote uses. The alarm output with user-defined setpoint alerts you when upset or changing conditions occur. This feature allows you to program a switch closure at a concentration value of your choosing.



The DUSTTRAK provides a real-time measurement based on 90° light scattering. A pump draws the sample aerosol through an optics chamber where it is measured. A sheath air system isolates the aerosol in the chamber to keep the optics clean for improved reliability and low maintenance.

TSI®

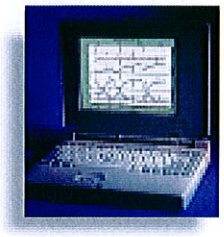
Specifications

Model 8520 DustTrak Aerosol Monitor

Sensor Type	90° light scattering
Range	0.001 to 100 mg/m³ (Calibrated to ISO 12103-1, A1 test dust)
Resolution	±0.1% of reading or ±0.001 mg/m³, whichever is greater
Zero Stability	±0.001 mg/m³ over 24 hours using 10-second time-constant
Particle Size Range	0.1 to approximately 10 micrometers
Flow Rate	Adjustable 1.4 to 2.4 l/min (1.7 nominally)
Temperature Coefficient	+0.001 mg/m³ per °C (for variations from temperature at which the DustTrak was zeroed)
Operating Temperature	32° F to 120° F (0°C to 50°C)
Storage Temperature	-4° F to 140° F (-20°C to 60°C)
Operating Humidity	0 to 95% rh (non-condensing)
Time Constant	Adjustable from 1 to 60 seconds
Data Logging	31,000 data points (21 days of logging once/minute)
Logging Interval	Adjustable from 1 second to 1 hour
Physical	
External Dimensions	8.7 in. × 5.9 in. × 3.4 in. (221 mm × 150 mm × 87 mm)
Instrument Weight	3.3 pounds with batteries (1.5 kg)
Serial Interface	RS-232 1200 baud
Power	
AC	AC adapter (included)
Battery	Four C-size alkaline batteries (included)
Battery Run-time	Alkaline 16 hours

Analog Output Specifications

Analog Output Voltage	0 to 5 VDC
Analog Output Scaling[1]	0 to 100 mg/m³ 0 to 10.0 mg/m³ 0 to 1.00 mg/m³ 0 to 0.100 mg/m³
Output Impedance	0.01 ohm
Maximum Output Current	15 mA



The DustTrak comes complete with TSI's TrakPro™ Data Analysis Software to allow you to perform a more comprehensive analysis of your measurement results. This exclusive Windows®-based program helps you generate the detailed graphs and reports needed to effectively communicate your findings.

Specifications are subject to change without notice.
Windows is a registered trademark of the Microsoft Corporation.

Alarm Output Specifications

Type	Non-latching, MOSFET solid state (polarized)[2] analog switch
Setpoint Range[1]	0.010 to 100 mg/m³
Maximum Voltage	15 VDC
Maximum Current	1 Amp
Deadband	-5% of alarm setpoint
Connector	4-Pin, Mini-DIN connector

1 User selectable through TrakPro™ Data Analysis Software.
2 See TSI Application Note ITI - 074 for important wiring information.

Ordering Information

Model	Description
8520	The DustTrak Aerosol Monitor and accessories includes: Auxiliary Analog and Alarm Outputs, Carrying Case, Alkaline Batteries, TrakPro™ Data Analysis Software, Filter, Computer Cable, 25-pin to 9-pin Adapter, Operation Service Manual, Calibration Certificate, 10 mm Nylon Dorr-Oliver Cyclone, Inlet Conditioning Kit 1.0 and 2.5 µm, Sampling Extension Tube, Miscellaneous Service Tools and Two-Year Warranty.

Optional Accessories

Model	Description
8520-1	Environmental Enclosure



TSI Incorporated
500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 651 490 2811 **Toll Free:** 1 800 874 2811 **Fax:** 651 490 3824 **E-mail:** answers@tsi.com
TSI Germany—Tel: +49-241-523030 **Fax:** +49-241-5230349 **E-mail:** tsigmbh@tsi.com
TSI Sweden—Tel: +46-18-52-70-00 **Fax:** +46-18-52-70-70 **E-mail:** tsi@tsi.se

For current information
www.tsi.com

CERTIFIED ISO 9001

P/N 2980077 Rev. C
Copyright © 2002 by TSI Incorporated
Printed in U.S.A.

MiniRAE 2000

Portable Handheld VOC Monitor

The rugged MiniRAE 2000 is the smallest pumped handheld volatile organic compound (VOC) monitor on the market. Its Photoionization Detector's (PID) extended range of 0 to 10,000 ppm makes it an ideal instrument for applications from environmental site surveying to HazMat/ Homeland Security.

AutoRAE Compatible

Wireless



Key Features

- **Proven PID technology** The patented sensor provides a 3-second response up to 10,000 ppm and sets a new standard for resistance to moisture and dirt.
- **Wireless communication enabled and certified**
- **Self-cleaning lamp and sensor** The patented self-cleaning lamp and sensor minimize the need for maintenance and calibration.
- **The MiniRAE 2000 lamp and sensor can be taken apart in seconds for easy maintenance without tools!**
- **Measure more chemicals than with any other PID.** With over 100 Correction Factors built into the MiniRAE 2000 memory and the largest printed list of Correction Factors in the world (300+), RAE Systems offers the ability to accurately measure more ionizable chemicals than any other PID. When a gas is selected from the MiniRAE 2000's library, the alarm points are automatically loaded into the meter.
- **User friendly** screens make it easy to use for simple applications and flexible enough for sophisticated operations.
- **Drop-in battery** When work schedules require putting in more than the 10 hours supplied by the standard NiMH battery, the drop-in alkaline pack supplied with every MiniRAE 2000 lets you finish the job.
- **Rugged Rubber Boot** The standard rubber boot helps assure that the MiniRAE 2000 survives the bumps and knocks of tough field use.
- **Strong, built-in sample pump** draws up to 100 feet (30 m) horizontally or vertically.
- **Tough, flexible inlet probe**
- **Large keys** operable with 3 layers of gloves.
- **Easy-to-read display** with backlight.
- **Stores up to 267 hours of data** at one-minute intervals for downloading to PC.
- **3-year 10.6 eV lamp warranty**

Applications

HazMat/Homeland Security

- Initial PPE (personal protective equipment) assessment
- Leak detection
- Safety perimeter establishment and maintenance
- Spill delineation
- Decontamination
- Remediation

Industrial Hygiene/Safety

- Confined Space Entry (CSE)
- Indoor Air Quality (IAQ)
- Worker exposure studies

Environmental

- Soil and water headspace analysis
- Leaking underground storage tanks
- Perimeter fenceline monitoring
- Fugitive emissions (EPA Method 21)
- Vapor recovery breakthrough
- Landfill monitoring

ver12_04.07

Specifications*

Detector Specifications

Size	8.2" L x 3.0" W x 2.0" H (21.8 x 7.62 x 5.0 cm)
Weight	20 oz with battery pack (553 g) w/o rubber boot
Sensor	Photoionization sensor with standard 10.6 eV or optional 9.8 eV or 11.7 eV UV lamp
Battery	• Rechargeable, external, field-replaceable Nickel-Metal-Hydride (NiMH) battery pack • Alkaline battery holder (for 4 AA batteries)
Operating Period	10 hours continuous operation
Display	Large LCD, backlight activated manually, by alarms or by darkness
Keypad	1 operation and 2 programming keys
Direct Readout	• VOCs as ppm by volume • High and low values • STEL and TWA (in hygiene mode) • Battery and shut down voltage
Alarms	90 dB buzzer and flashing red LED to indicate exceeded preset limits: • High: 3 beeps and flashes per second • Low: 2 beeps and flashes per second • STEL and TWA: 1 beep and flash per second • Alarms automatic reset or latching with manual override • Optional plug-in pen size vibration alarm • User adjustable alarm limits
Calibration	Two-point field calibration of zero and standard reference gas. Calibration memory of 8 calibration gases, alarm limits, span values and calibration date
Datalogging	267 hours (at one-minute intervals) with date/time. Header information includes monitor serial number, user ID, site ID, date and time
Sampling Pump	• Internal, integrated flow rate of 400 cc/min • Sample from 100' (30 m) horizontally or vertically
Low Flow Alarm	Auto shut-off pump at low flow condition
Communication	Download data and upload instrument set-up from PC through RS-232 link to serial port. Wireless communication enabled and certified (requires RAELink2 and ProRAE Remote to use)
Temperature	14° F to 104° F (-10° C to 40° C)
Humidity	0% to 95% relative humidity (non-condensing)
EM/RFI	Highly resistant to EMI /RFI. Compliant with EMC Directive 89/336/EEC
IP-rating	IP-55: protected against dust, protected against low-pressure jets of water from all directions
Hazardous Area Approval	• **US and Canada:** UL and cUL, Classified for use in Class I, Division 1, Groups A, B, C and D hazardous locations • **Europe:** ATEX II IG EEx ia IIC T4
Attachment	Durable bright yellow rubber boot w/belt clip & wrist strap
Warranty	Lifetime on non-consumable components (per RAE Systems Standard Warranty), 3 years for 10.6.V PID lamp, 1 year for pump and battery

***** Specifications are subject to change

****** Performance based on isobutylene calibration

Default Sensor Settings**

Gas Monitor (ppm)	Range (ppm)	Resolution Time (T90)	Response
VOCs	0 to 99.9 ppm	0.1 ppm	< 3 sec
	100 to 10,000 ppm	1 ppm	< 3 sec

MiniRAE 2000 and Accessories

Monitor only includes:

- RAE Systems UV lamp: 10.6 eV, 9.8 eV or 11.7 eV as specified
- ProRAE Suite software package for Windows® 98, NT, 2000 and XP
- Computer interface cable
- 5-inch Flex-I-Probe
- External filter
- Rubber boot with belt clip
- Alkaline battery adapter
- Tool kit
- Lamp cleaning kit
- Nickel-Metal-Hydride (NiMH) battery
- 120/230 V AC/DC wall adapter (if specified)
- Operation and maintenance manual

Monitor with accessories kit adds:

- Hard transport case with pre-cut foam padding
- 5 porous metal filters and O-rings
- Organic vapor zeroing adapter
- Gas outlet port and tubing

Optional calibration kit adds:

- 10 ppm isobutylene calibration gas, 34L
- Calibration regulator and flow controller

Optional Guaranteed Cost of Ownership Program:

- 4-year repair and replacement guarantee
- Annual maintenance service

DISTRIBUTED BY:

ver12_04.07

RAE Systems Inc.
3775 North First Street
San Jose, CA 95134 USA
raesales@raesystems.com

USA/Canada 1-877-723-2878
Europe/Russia +45 8652 5155
Middle East/Australia 971 50 429 1385
China 8610 58858788
Asia +852 2669 0828

www.raesystems.com

Daily Field Calibration Form

BMS Syracuse North Campus Restoration Area Program **Bristol-Myers Squibb Company East Syracuse, NY**	**Date:**	**Station ID:**
	Operator(s):	**Project No.:**
	Test Parameters: Particulates and Total VOCs	

CALIBRATION STANDARDS

Instrument	Zero	Span
Particulates (PM_{10}):	HEPA Filter	*No field span check*
VOCs:	UHP Zero air	5 ppm Isobutylene

CALIBRATION CHECK TOLERANCE LIMITS

Instrument	Zero	Span
Particulates (PM_{10}):	≥ 0.0 and ≤ 10 $\mu g/m^3$	None
VOCs:	≥ 0.0 and ≤ 0.2 ppm	$\leq \pm$ 10% of span

CALIBRATION CHECK RESULTS

DUST (PARTICULATE) MONITOR

Station #	Time	Instrument S/N	Zero	Span	In Tolerance?	Comments
1				NA		
2				NA		
3				NA		
4				NA		
5				NA		
6				NA		
7				NA		
8				NA		

VOC MONITOR

Station #	Time	Instrument S/N	Zero	Span	In Tolerance?	Comments
1						
2						
3						
4						
5						
6						
7						
8						

COMMENTS

Air Quality Monitoring Daily Log

General Project Information	
BMS Syracuse North Campus Restoration Area Program **Bristol-Myers Squibb Company East Syracuse, NY**	Today's Date: Operator: Weather: General Activity Description

UPWIND STATIONS

Monitor	Location	15 min TWA Range		Start Time	End Time
		TVOCs	Particulates		
Upwind #1					
Upwind #2					

DOWNWIND STATIONS

Monitor	Location	15 min TWA Range*		Start Time	End Time
		TVOCs	Particulates		
Downwind #1					
Downwind #2					
Downwind #3					
Downwind #4					
Downwind #5					
***Alarm Response Summary: (If exceedance place "Y" after range)**					
Response Levels	TVOCs: 5 ppm STOP WORK and Control Source Particulates : 100 µg/m3 – Control Dust		25 ppm – STOP Work until controls work 150 µg/m3 – STOP WORK until controls work		

General Observations and Notes (visible dust, control details)

APPENDIX F

Health and Safety Plan

Site Specific Health and Safety Plan

Revision 17h

Project Name:	BMS East Syracuse
Project Number:	30030236
Client Name:	Bristol Myers Squibb
Date:	11/3/2020
HASP Expires	11/3/2021
Revision:	3

Approvals:

HASP Developer: Brian McCann

Project Manager: William McCune

HASP Reviewer: Dan Zuck

Revised: 6/1/2020

Arcadis Field and Embedded Staff COVID-19 Guidance

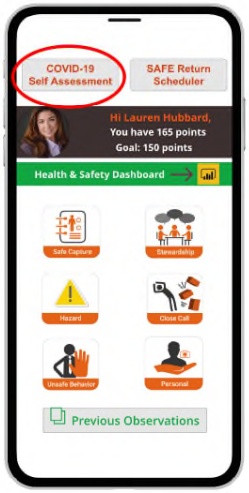
See COVID-19 Plan for More Information Check the Orange Line Daily

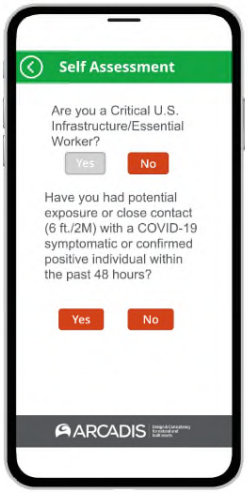
ARCADIS Design & Consultancy for natural and built assets

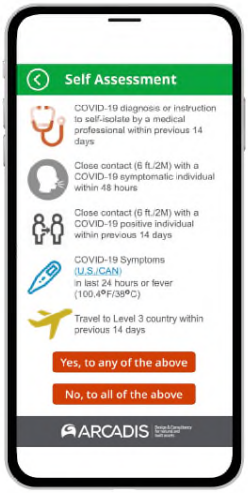


COVID-19 SELF ASSESSMENT

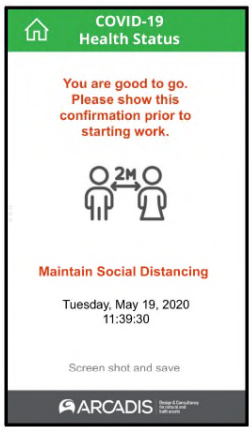
Arcadis staff visiting offices and project sites must complete the COVID-19 Health Screening Self-Assessment Questionnaire prior to each visit. Arcadis staff can now use the H&S App to complete their daily (or multiple times a day, if appropriate) COVID-19 Health Screening Self-Assessment. The data entered into the H&S App COVID-19 Health Screening Self-Assessment form is not stored.



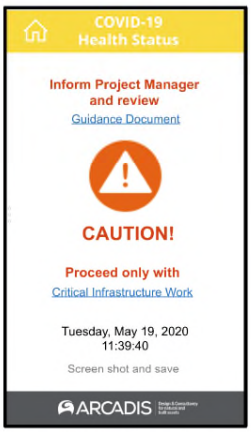




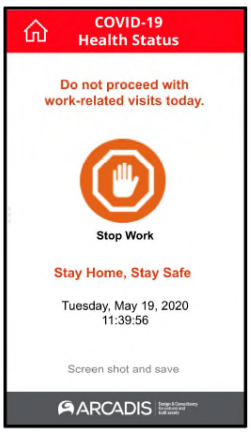
Upon completion of the COVID-19 Health Screening Self-Assessment in the H&S App, the user will receive a green, yellow or red completion message (as shown below).



Green – proceed to the office or project site



Yellow (Caution) – critical infrastructure/essential worker must contact the Project Manager and review the "H&S App Yellow Caution Status Guidance"



Red – do not proceed to the office or project site

Arcadis Culture of Caring

Arcadis is committed to a Culture of Caring that ensures each Arcadis employee, part time as needed employee (PTAN), temporary agency employee under Arcadis day to day control, Inexperienced Workers and contractor (cumulatively referred to here as "field staff") goes home at the end of the day free from injury or illness. I certify that the following has been performed with all Arcadis field staff on this project either in person or by Skype:

[x] Reviewed the HASP including a discussion of hazard identification and controls.

- [x] If conducting activities deemed by Arcadis to be "High Risk", frontline management has reviewed applicable H&S standards (Job Safety Analysis [JSA] when authorized by H&S) for these activities with field staff.
- [x] If permit to work is required, frontline management has reviewed the permit(s) with field staff.

[x] Reviewed proactive H&S engagement expectations/injury prevention actions.

[x] Reviewed Stop Work Authority.

[x] Reviewed the incident reporting process and expectations including when WorkCare should be contacted by staff (WorkCare incident intervention for all minor, non-emergency injuries) and that the WorkCare phone number is programmed into field team cell phone.

[ ] For Inexperienced Workers, a mentor has been assigned for the new task being performed.

For short service employees (SSEs), PTANS* and temporary agency employees* :

[x] Provided coaching and mentoring on Arcadis H&S expectations during project work. Reviewed in detail specific hazards and controls and provided a resource who can be contacted if individual has questions regarding planned or unplanned work tasks.

Mentor/Resource # Dan Zuck (Name) 516-369-2741 (Phone Number)

Signed:

William McCune Project Manager

* Upon hiring/contracting for the first time.

Emergency Information

Site Address: 6000 Thompson Rd, East Syracuse NY 13211

Emergency Phone Numbers:

Emergency (fire, police, ambulance)		911
Emergency (facility specific, if applicable):		
BMS Security Desk		(315) 432-2121
BMS Emergency Number		(315) 432-2300
Emergency Other (specify):		
Primary Client Contact:	Anne Locke	(315) 432-2660
WorkCare (non-life-threatening injury/illness):		1-888-449-7787
Project H&S:	Daniel Zuck	(516) 369-2741 (m)
Task Manager:	Dave Cornell	(315) 439-6222 (m)
Project Manager:	William McCune	(315) 671-9172
Corporate H&S Specialist:	Julie Santaniello	978-551-0033
Corporate H&S Director:	Denis Balcer	614-778-9171

Hospital Name and Address:

Upstate University Hospital
750 East Adams Street
Syracuse, NY 13210

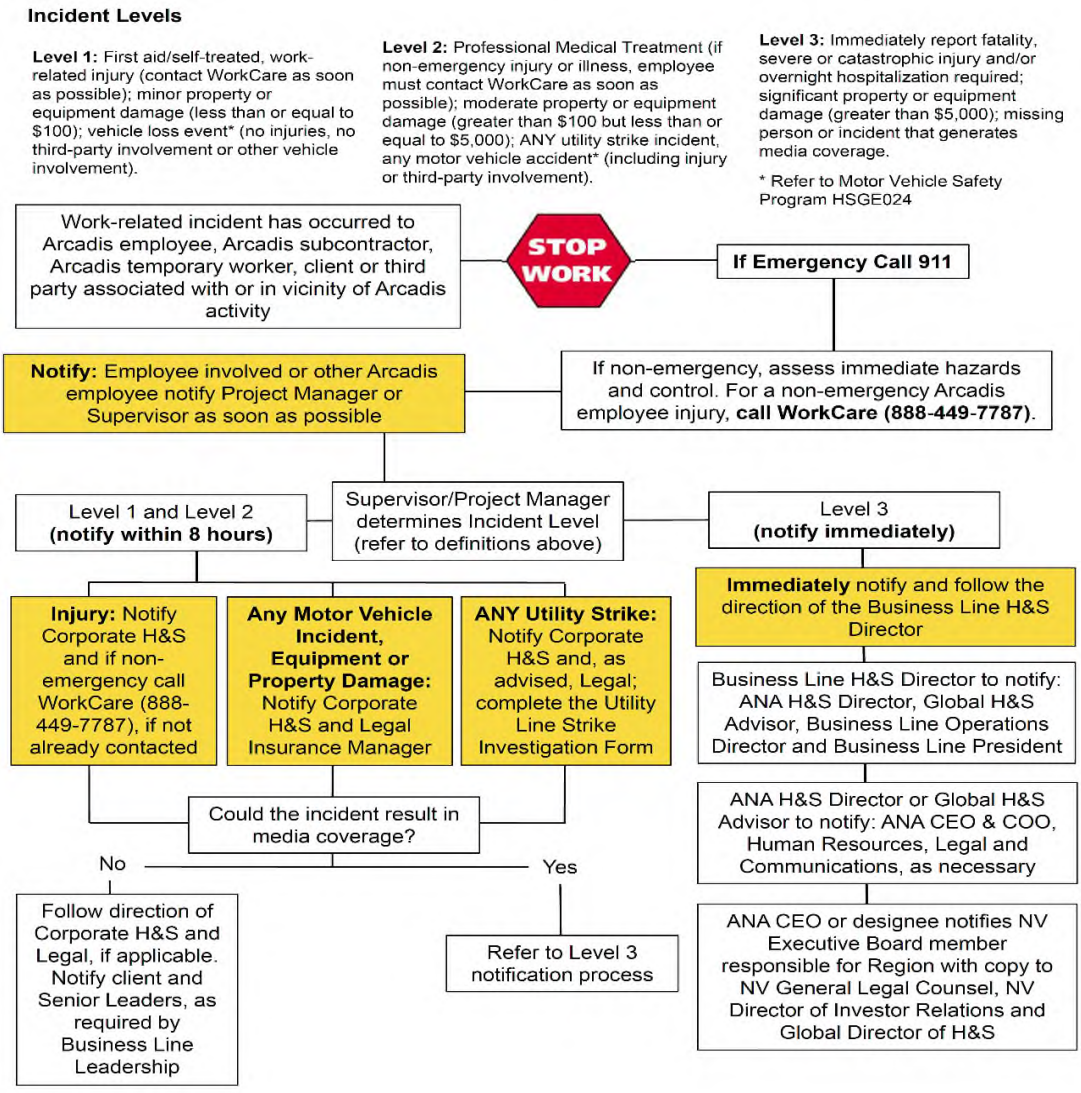
Hospital Phone Number: **(315) 464-5540**

Supplemental Client Contact Information:

Other Important Phone Numbers:

Poison Control Center	1-800-222-1222
Nat. Response Ctr. (spills in reportable quantities)	1-800-424-8802
U.S. Coast Guard (spills to water)	1-800-424-8802

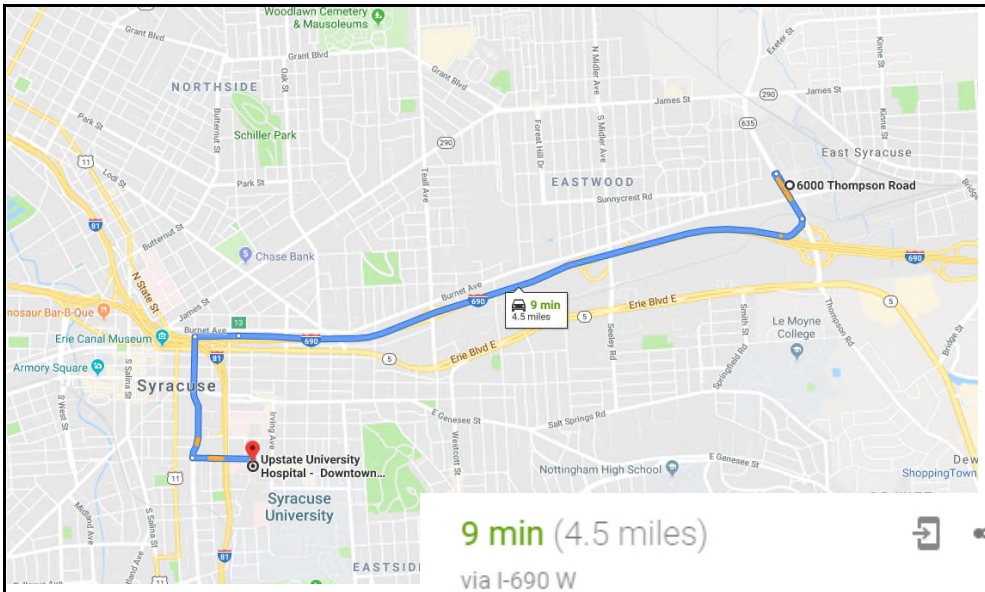
Incident Reporting Protocol Within Arcadis



Client Incident Reporting Protocol

1. Dial 911 (if necessary) and/or Work Care - (888) 449-7787
2. Contact BMS Emergency - (315) 432-2300
3. Contact Dan Zuck (Project H&S) - (516) 369-2471
4. Contact BMS PM Anne Locke (315) 432-2660

Route to the Hospital



9 min (4.5 miles)

via I-690 W

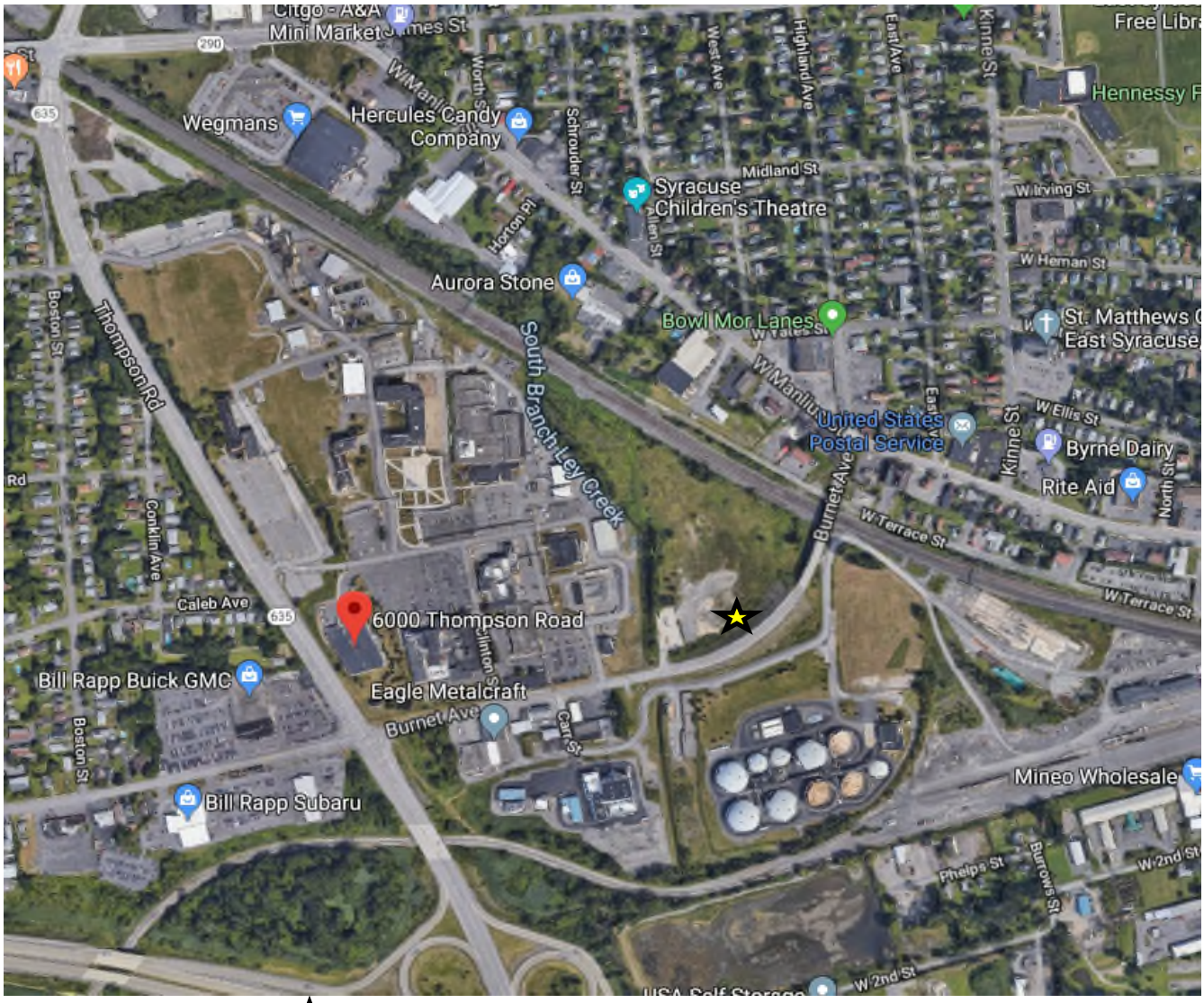
Fastest route, the usual traffic

6000 Thompson Rd
East Syracuse, NY 13057

1. Head northwest on NY-635 N
   453 ft
2. Make a U-turn
   0.3 mi
3. Use the right lane to merge onto I-690 W via the ramp to Syracuse
   3.0 mi
4. Take exit 13 for Townsend St toward Downtown
   0.2 mi
5. Use the left 2 lanes to turn left onto N Townsend St
   0.6 mi
6. Turn left onto E Adams St
   Destination will be on the right
   0.3 mi

Upstate University Hospital - Downtown Campus
750 E Adams St, Syracuse, NY 13210

Site Map Showing Assembly Areas



Assembly Area

Site Type

The project site is an active facility with the following attributes:

Buildings	
Industrial	
Parking Lot/Private Drive (NON ROW)	

Work will require the use of a Non-ROW TSP for private roadways and parking areas, and will also require coordination with BMS EHS.

Surrounding Land Use and Topography

Surrounding land use and topography information are located in the project work plan. The site safety officer will ensure the project work plan: 1) addresses land use and topography information required by this section, 2) is filed with this HASP on site and 3) is readily accessible to all field staff on this project.

Simultaneous Operations (SimOps)

SimOps is expected or will be conducted in proximity to Arcadis work activities on the project site. SimOps creates unique hazards that could affect Arcadis employees and subcontractors and SimOps hazards identified on site will be addressed in the JSA or similar governing document (i.e. permit) for affected Arcadis work tasks. If the SimOps work activities create a high hazard to Arcadis staff or subcontractors, Arcadis will utilize stop work until the SimOps activity is complete or will coordinate work activities with SimOps workers and/or client to ensure SimOps work hazards are mitigated.

Site Background

Site background information is located in the project work plan. The site safety officer will ensure the project work plan: 1) addresses site background information required by this section, 2) is filed with this HASP on site and 3) is readily accessible to all field staff on this project.

Project Tasks

The following tasks are identified for this project:

1. Driving - Motor Vehicles
2. Site Survey and Inspections
3. Arcadis oversight of Soil boring installation and abandonment
4. Arcadis Collection of Soil Samples
5. Monitoring Well or Test Boring Gauging, and Collection of Grab Groundwater Samples
6. Arcadis Oversight of Land Surveying or Utility Clearance Contractor
7. IDW Management
8. Indoor Air Sampling
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.

Supplemental requirements associated with the above task(s):

The Arcadis Utility Clearance Checklist must be used for utility clearance activities.

Client H&S information is attached.

Methylene Chloride is present at the site in the areas of Building 458 and CHAPA If subsurface intrusive work is to be conducted in proximity to these areas:

Review the HASP Respiratory Protection Plan and SDS for methylene chloride before starting work.

Review and discuss exposure controls preventative measures and symptoms of exposure during tailgate briefings. Review the HASP for required air monitoring action levels and field equipment.

Air monitoring equipment will be calibrated daily before work. Engineering controls such as ventilation fans will be used. Determine, delineate and monitor the exclusion zone for airborne hazards. Personnel not associated with the drilling shall stay out of the exclusion zone to prevent 3rd party traffic from entering the support area surrounding the exclusion zone. If 3rd party traffic approaches the support area, work will cease

[X] Required Checklists/Work Forms	[X] Required Permits
Tailgate Safety Briefing Form	*BMS Issued Work Permits*
Vehicle Inspection Checklist	
Utility and Structures Checklist	[X] Required H&S Standards
	Respiratory Protection_ARC HSGE017
	Utility Location Procedures_ARC HSFS019

Short Service Employees (SSEs)

SSEs (employees who are employed with Arcadis for less than 1 year or are Inexperienced Workers) have the potential to work on this project. If SSEs are utilized, the project team working in conjunction with the SSE's administrative supervisor will ensure requirements of ARC HSGE019 "Short Service Employees" are completed. SSE's will be identified on the project Tailgate Safety Meeting Form.

Roles and Responsibilities

	Name	Role	Short Service Employee
1	William McCune	Project Manager (PM)	No
2	Not Applicable	Associate Project Manager (APM)	No
3	Dave Cornell	Task Manager	No
4	Josh Miller	Field Technical Lead	No
5	Josh Miller	Site Safety Officer (SSO)	No
6			
7			
8			
9			
10			

Training

All Arcadis employees are required to have the following training to be on site:

H&S Program Orientation (non-certificat
HAZCOM GHS/EAP (non-certificate)
Hazwoper 40-Hour
Hazwoper 8-Hour Annual Refresher
PPE (non-certificate)
Defensive Driving - Smith On-Line
Hearing Conservation/Protection
None
None
None
None
None
None
Client specific:
BMS Site Orientation Video (EHS)
Other:

Selected Arcadis employees are required to have the following additional training:

	Names or Numbers from above
Hazwoper 8-Hour Supervisor	4 or 5
DOT HazMat #1	4
First Aid/CPR	4,5
BBP (Bloodborne Pathogens)	4,5
Fire Extinguisher (non-certificate)	4,5
Respirator	Bldg. 55 Workers
None	
None	
None	
None	
None	
None	
None	
None	
None	
Other:	

The Arcadis Fundamental H&S Principles

Staff working on any of the task(s) listed above must utilize the six Arcadis Fundamental H&S Principles to ensure work is conducted safely. These principles include: 1) Use of TRACK, 2) H&S Planning, 3) Stop Work Authority, 4) "If Not Me Then Who", 5) Stewardship, and 6) Incident Reporting. Every project team member plays an important role in project health and safety. This is more than just having a HASP, training, or PPE. Proactive staff engagement with these principles is critical to a safe work environment.



General Task Hazard Assessment and Risk Control (HARC)

General:	Hazards Applicable to All Project Tasks

The 12 hazard category HARC ratings are not available in this General THA. The mitigated and unmitigated ratings for the hazards presented are based on the Risk Assessment Matrix below. Modify hazards and ratings as necessary to meet project needs.

Risk Assessment Matrix		Likelihood Ratings			
Consequences Ratings		A	B	C	D
People	Property	0 Almost Impossible	1 Possible but Unlikely	2 Likely to Happen	3 Almost Certain to Happen
1-Slight or No Health Effect	Slight or No Damage	0-Low	1-Low	2-Low	3-Low
2-Minor Health Effect	Minor Damage	0-Low	2-Low	4-Medium	6-Medium
3-Major Health Effect	Local Damage	0-Low	3-Low	6-Medium	9-High
4-Fatalities	Major Damage	0-Low	4-Medium	8-High	12-High

Hazard #1

Driving - On road - Injury or vehicle damage from motor vehicle accident or incident

Suggested FHSHB Ref:	3.4	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	HIGH	Smith System (on line)
Mitigated Risk:	MEDIUM	JSAs
Comments:	Use Smith System "5-Keys" when driving. See Driving JSA for details.	

Hazard #2

Driving - Driver - Injury, death or property damage due to driver distraction, fatigue, etc.

Suggested FHSHB Ref:	3.4, 3.21	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	HIGH	Smith System (on line)
Mitigated Risk:	LOW	Driver awareness and use of stop work authority
Comments:	Use route planning. Keep eyes moving while driving. See Driving JSA.	

Hazard #3

Biological - skin/eye irritation or damage from poisonous plants

Suggested FHSHB Ref:	3.17.11	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	LOW	Job Briefing/Site Awareness
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Use skin pre-treatment lotions when available.	

Hazard #4

Biological - bites or stings from exposure to insects or arachnids

Suggested FHSHB Ref:	3.17: 2,3,7,8,9,10	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	LOW	Job Briefing/Site Awareness
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Do body check daily.	

Hazard #5

Biological - cuts, scrapes, skin/eye puncture from exposure to physically damaging plants

Suggested FHSHB Ref:	3.17.11	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	Job Briefing/Site Awareness
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:		

General Task HARC (continued)

Hazard #6		
Environmental - Thermal stress - Injury or illness from heat or cold		
Suggested FHSHB Ref:	3.16	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	Field H&S Handbook (see ref. above)
Mitigated Risk:	LOW	JSAs
Comments:	Use job rotation or rest breaks. Stay hydrated and eat regularly.	
Hazard #7		
Environmental - Inclement weather -Injury or equipment damage from inclement weather		
Suggested FHSHB Ref:	3.12	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	Weather Monitoring
Mitigated Risk:	LOW	Cont./Emerg. Planning
Comments:	Use 30/30 rule for lightning. See FHSHB for details.	
Hazard #8		
Motion - Musculoskeletal - Injury from lifting, twisting , stooping, or awkward body positions		
Suggested FHSHB Ref:	3.29.1	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	Engineering Controls (specify in comments)
Mitigated Risk:	LOW	Admin. Controls (specify in comments)
Comments:	Use proper lifting techniques. Use job rotation when applicable. See FHSHB for details.	
Hazard #9		
Motion - Musculoskeletal - Injury from repeated work activity or body motion		
Suggested FHSHB Ref:	3.29.2	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	Engineering Controls (specify in comments)
Mitigated Risk:	LOW	Admin. Controls (specify in comments)
Comments:	Use proper lifting techniques. Use job rotation when applicable. See FHSHB for details.	
Hazard #10		
Sound - Noise - Injury or illness due to noise exposure		
Suggested FHSHB Ref:	3.15	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	Engineering Controls (specify in comments)
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Increase distance from source if possible. Maintain equipment.	
Hazard #11		
Gravity - Falls - Injury due to slips and trips		
Suggested FHSHB Ref:	3.26.4, 4.11	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	Site Awareness
Mitigated Risk:	LOW	Housekeeping
Comments:	Use footwear appropriate for site conditions, plan routes and do not hurry while walking.	

Task Specific HARC

Task 1:	Driving - Motor Vehicles								
HARC Unmitigated Hazard Types (H-High, M-Medium, L-Low):							FHSHB Ref:		3.4
Biological	-	Chemical	-	Driving	H	Electrical	-		
Environmental	-	Gravity	-	Mechanical	-	Motion	-		
Personal Safety	L	Pressure	-	Radiation	-	Sound	-		

Task 2:	Site Survey and Inspections								
HARC Unmitigated Hazard Types (H-High, M-Medium, L-Low):							FHSHB Ref:		3.9
Biological	L	Chemical	L	Driving	M	Electrical	L		
Environmental	L	Gravity	M	Mechanical	L	Motion	L		
Personal Safety	L	Pressure	L	Radiation	L	Sound	L		

Hazard #1

Environmental - Lighting - Injury or property damage working in poorly lit areas

Suggested FHSHB Ref:	3.18	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	Field H&S Handbook (see ref. above)
Mitigated Risk:	LOW	Engineering Controls (specify in comments)
Comments:	Bring Flashlight when inspecting areas of the site. Do not attempt to enter any spaces where lights to not function, or Arcadis is not permitted.	

Hazard #2

Motion - Struck by - Bodily injury from impact with moving object

Suggested FHSHB Ref:	2.5, 3.22	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	H&S Standards
Mitigated Risk:	LOW	Job Briefing/Site Awareness
Comments:	Be aware of onsite traffic patterns depending on the area that is being inspected. Forklifts might be present at loading docks, lawn mowers may be present in grassy areas, vehicles or golf carts may be present on the site roadways. All Arcadis personnel must wear Class 2 reflective clothing while onsite. Park vehicles to protect workers when momentarily stopped. If longer duration is required, refer to TSP for traffic control configurations.	

Hazard #3

Motion - Cuts and scrapes - Injury from moving object impacting skin or eye

Suggested FHSHB Ref:	2.5, 3.22	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	PPE (see HASP "PPE" section)
Mitigated Risk:	LOW	Job Briefing/Site Awareness
Comments:	Wear PPE in accordance with HASP. Gloves are required even while walking onsite	

Task Specific HARC (continued)

Task 3:	Arcadis oversight of Soil boring installation and abandonment

HARC Unmitigated Hazard Types (H-High, M-Medium, L-Low): FHSHB Ref: 4.5

Biological	L	Chemical	L	Driving	-	Electrical	L
Environmental	L	Gravity	M	Mechanical	M	Motion	M
Personal Safety	-	Pressure	L	Radiation	-	Sound	M

Hazard #1

Chemical - liquids - injury or illness from vapor inhalation

Suggested FHSHB Ref:	3.2, 3.22, 3.30, 3.33	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	See HASP "Monitoring" section
Mitigated Risk:	LOW	Specialized Equipment (specify in comments)
Comments:	Vapor inhalation during sub surface intrusive work. High Methylene Chloride concentrations are known to be found near Building 55. Air monitoring shall be conducted in accordance to relevant task specific monitoring plan (Tab 7 or Tab 7a), using monitoring instruments in accordance with that tab. If action level is reach and cannot be controlled, work will promptly stop.	

Hazard #2

Chemical - liquids, skin or eye irritation/damage/allergy

Suggested FHSHB Ref:	3.9, 3.22, 3.30, 3.33	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Refer to Monitoring Well and Drilling JSA for PPE requirements and guidance. Do not handle impacted media without Nitrile gloves. If a splash hazard exists, upgrade to a face shield	

Hazard #3

Chemical - solids/particulates, skin or eye irritation/damage/allergy

Suggested FHSHB Ref:	3.9, 3.22, 3.30, 3.33	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Refer to Monitoring Well and Drilling JSA for PPE requirements and guidance. Do not handle impacted soils without Nitrile gloves. If the use of work gloves is required, nitriles should be worn underneath leather work gloves.	

Hazard #4

Motion - Struck by - Bodily injury from impact with moving object

Suggested FHSHB Ref:	2.5, 3.22	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	H&S Standards
Mitigated Risk:	LOW	Engineering Controls (specify in comments)
Comments:	Refer to TSP for traffic controls to be implemented depending on task duration. All Arcadis personnel shall wear class 2 reflective clothing while onsite. Position work vehicles to protect work area from traffic.	

Task Specific HARC (continued)

Task 3 (continued):	None
Hazard #5	
Motion - Cuts and scrapes - Injury from moving object impacting skin or eye	
Suggested FHSHB Ref:	2.5, 3.22
Overall Unmitigated Risk:	MEDIUM
Mitigated Risk:	LOW
Comments:	Wear PPE as required by the HASP and JSA. Keep back from work area while drill rig is operating. Establish exclusion zone per TSP to reduce the risk of third party interaction.
To mitigate this hazard, use TRACK and the following:	
PPE (see HASP "PPE" section)	
H&S Standards	
Hazard #6	
Environmental - Utilities - Injury or property damage from utility strike/damage	
Suggested FHSHB Ref:	3.36
Overall Unmitigated Risk:	HIGH
Mitigated Risk:	MEDIUM
Comments:	Utility clearance shall be conducted in accordance with the Arcadis Utility Clearance Standard. 3 lines of evidence shall be established before any ground disturbance.
To mitigate this hazard, use TRACK and the following:	
Specialized Checklist/Forms	
H&S Standards	

Task Specific HARC (continued)

Task 4:	Arcadis Collection of Soil Samples

HARC Unmitigated Hazard Types (H-High, M-Medium, L-Low): FHSHB Ref: 3.9

Biological	L	Chemical	L	Driving	-	Electrical	M
Environmental	L	Gravity	M	Mechanical	M	Motion	M
Personal Safety	L	Pressure	L	Radiation	-	Sound	M

Hazard #1

Chemical - solids/particulates, skin or eye irritation/damage/allergy

Suggested FHSHB Ref:	3.9, 3.22, 3.30, 3.33	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Skin or eye contact with impacted soils. Wear level D PPE in accordance with HASP and soil sampling JSA. Decon tools and equipment after use.	

Hazard #2

Chemical - liquids, skin or eye irritation/damage/allergy

Suggested FHSHB Ref:	3.9, 3.22, 3.30, 3.33	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Skin or eye contact with impacted water, preservatives or saturated soils. Wear level D PPE in accordance with HASP and soil sampling JSA. Decon tools and equipment after use. Upgrade to face shield if splash hazard exists.	

Hazard #3

Chemical - liquids - injury or illness from vapor inhalation

Suggested FHSHB Ref:	3.2, 3.22, 3.30, 3.33	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	See HASP "Monitoring" section
Mitigated Risk:	LOW	Specialized Equipment (specify in comments)
Comments:	Vapor inhalation during sub surface intrusive work. High Methylene Chloride concentrations are known to be found near Building 55. Air monitoring shall be conducted in accordance to relevant task specific monitoring plan (Tab 7 or Tab 7a), using monitoring instruments in accordance with that tab. If action level is reach and cannot be controlled, work will promptly stop.	

Hazard #4

Motion - Cuts and scrapes - Injury from moving object impacting skin or eye

Suggested FHSHB Ref:	2.5, 3.22	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	PPE (see HASP "PPE" section)
Mitigated Risk:	LOW	JSAs
Comments:	Cuts or scrapes to hands or skin opening liners, using tools, handling sampling equipment and glass ware. Wear cut resistant glove liners or gloves with nitrile gloves over when handling tools, equipment or materials. Do not over tighten sample bottles.	

Hazard #5

Motion - Struck by - Bodily injury from impact with moving object

Suggested FHSHB Ref:	2.5, 3.22	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	H&S Standards
Mitigated Risk:	LOW	Engineering Controls (specify in comments)
Comments:	Refer to TSP for traffic controls to be implemented depending on task duration. All Arcadis personnel shall wear class 2 reflective clothing while onsite. Position work vehicles to protect work area from traffic. Arcadis staff shall keep out of drilling exclusion zone while drilling is occurring.	

Task Specific HARC (continued)

Task 5:	Monitoring Well or Test Boring Gauging, and Collection of Grab Groundwater Sampl

HARC Unmitigated Hazard Types (H-High, M-Medium, L-Low): FHSHB Ref: 3.9

Biological	L	Chemical	M	Driving	-	Electrical	-
Environmental	M	Gravity	M	Mechanical	-	Motion	M
Personal Safety	L	Pressure	L	Radiation	-	Sound	L

Hazard #1

Chemical - liquids, skin or eye irritation/damage/allergy

Suggested FHSHB Ref:	3.9, 3.22, 3.30, 3.33	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Refer to JSA for PPE requirements and guidance. Do not handle impacted media without Nitrile gloves. If a splash hazard exists, upgrade to a face shield	

Hazard #2

Mechanical - Pinch point - Injury by pinching of body part in mechanical process

Suggested FHSHB Ref:	3.27.4	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	Site Awareness
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Be aware of potential pinch points from monitoring well lids and stickup lids. Use long handled screw drivers to pry lids open after removing bolts/locks. Wear leather work gloves when handling tools and materials.	

Hazard #3

Motion - Struck by - Bodily injury from impact with moving object

Suggested FHSHB Ref:	2.5, 3.22	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	H&S Standards
Mitigated Risk:	LOW	Engineering Controls (specify in comments)
Comments:	Refer to TSP for traffic controls to be implemented depending on task duration. All Arcadis personnel shall wear class 2 reflective clothing while onsite. Position work vehicles to protect work area from traffic.	

Hazard #4

Motion - Cuts and scrapes - Injury from moving object impacting skin or eye

Suggested FHSHB Ref:	2.5, 3.22	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	Site Awareness
Comments:	Use tools to open well lids and wear sturdy work gloves when handling the lids, locking caps and locks. Keep face away from locking cap when opening.	

Task Specific HARC (continued)

Task 6:	Arcadis Oversight of Land Surveying or Utility Clearance Contractor							
HARC Unmitigated Hazard Types (H-High, M-Medium, L-Low):						FHSHB Ref:		3.9
Biological	M	Chemical	-	Driving	-	Electrical	-	
Environmental	M	Gravity	M	Mechanical	-	Motion	M	
Personal Safety	L	Pressure	-	Radiation	-	Sound	L	

Hazard #1

Motion - Struck by - Bodily injury from impact with moving object

Suggested FHSHB Ref:	2.5, 3.22	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	H&S Standards
Mitigated Risk:	LOW	Job Briefing/Site Awareness
Comments:	Refer to TSP for traffic controls to be implemented depending on task duration. All Arcadis personnel shall wear class 2 reflective clothing while onsite. Position work vehicles to protect work area from traffic.	

Hazard #2

Motion - Cuts and scrapes - Injury from moving object impacting skin or eye

Suggested FHSHB Ref:	2.5, 3.22	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	PPE (see HASP "PPE" section)
Mitigated Risk:	LOW	H&S Standards
Comments:	Surveyors shall wear minimum PPE required by the HASP while onsite. Work gloves shall be worn when handling any equipment or tools.	

Task Specific HARC (continued)

Task 7:	IDW Management							
HARC Unmitigated Hazard Types (H-High, M-Medium, L-Low):						FHSHB Ref:		3.3
Biological	L	Chemical	M	Driving	-	Electrical	-	
Environmental	M	Gravity	M	Mechanical	L	Motion	M	
Personal Safety	L	Pressure	L	Radiation	-	Sound	L	

Hazard #1

Chemical - liquids, skin or eye irritation/damage/allergy

Suggested FHSHB Ref:	3.9, 3.22, 3.30, 3.33	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Refer to drum handling JSA. Pour liquids into drums by pouring away from your body. Upgrade to face shield if a splash hazard exists.	

Hazard #2

Chemical - solids/particulates, skin or eye irritation/damage/allergy

Suggested FHSHB Ref:	3.9, 3.22, 3.30, 3.33	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Refer to drum handling JSA. Do not handle impacted soils without nitrile gloves.	

Hazard #3

Mechanical - Pinch point - Injury by pinching of body part in mechanical process

Suggested FHSHB Ref:	3.27.4	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	PPE (see HASP "PPE" section)
Mitigated Risk:	LOW	Site Awareness
Comments:	Wear leather gloves when opening and closing drum lids. Use a cordless impact driver to tighten drum rings if possible. Keep fingers out from between drum ring and lid.	

Hazard #4

Motion - Cuts and scrapes - Injury from moving object impacting skin or eye

Suggested FHSHB Ref:	2.5, 3.22	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	PPE (see HASP "PPE" section)
Comments:	Wear PPE in accordance with Drum Handling JSA. Do not handle tools or equipment without leather work gloves. Keep face away from drum lid when opening.	

Task Specific HARC (continued)

Task 8:	Indoor Air Sampling							
HARC Unmitigated Hazard Types (H-High, M-Medium, L-Low):						FHSHB Ref:		3.9
Biological	L	Chemical	L	Driving	-	Electrical	-	
Environmental	-	Gravity	L	Mechanical	-	Motion	L	
Personal Safety	-	Pressure	-	Radiation	-	Sound	-	

Hazard #1

Mechanical - Pinch point - Injury by pinching of body part in mechanical process

Suggested FHSHB Ref:	3.27.4	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	PPE (see HASP "PPE" section)
Mitigated Risk:	LOW	Field H&S Handbook (see ref. above)
Comments:	When using wrenches to tighten canister fittings use cut resistant gloves	

Hazard #2

Chemical - gasses - injury due to inhalation, asphyxiation, skin/eye contact

Suggested FHSHB Ref:	3.30, 3.32	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	Hazcom Training
Comments:	PID Calibration should be done outside with fresh air, canisters need to be staged in a location that does not pose an explosion risk.	

Hazard #3

Motion - Musculoskeletal - Injury from lifting, twisting , stooping, or awkward body positions

Suggested FHSHB Ref:	3.29.1	To mitigate this hazard, use TRACK and the following:
Overall Unmitigated Risk:	MEDIUM	JSAs
Mitigated Risk:	LOW	Field H&S Handbook (see ref. above)
Comments:	Use caution when lifting sample boxes and various monitoring equipment	

Hazard Communication (HAZCOM)/Global Harmonization System (GHS)

[ ] HAZCOM/GHS for this project is managed by the client or general contractor

List the chemicals anticipated to be used by Arcadis on this project per HAZCOM/GHS requirements.
(Modify quantities as needed)

	Preservatives	Qty
[ ]	Not applicable	
[X]	Hydrochloric acid	<500 ml
[X]	Nitric acid	<500 ml
[ ]	Sulfuric acid	<500 ml
[ ]	Sodium hydroxide	<500 ml
[ ]	Zinc acetate	<500 ml
[ ]	Ascorbic acid	<500 ml
[ ]	Acetic acid	<500 ml
[ ]	Isopropyl alcohol	< 4 gal.
[ ]	Formalin (<10%)	< 4 gal.
[X]	Methanol	<500 ml
[ ]	Sodium bisulfate	<500 ml

	Decontamination	Qty
[ ]	Not applicable	
[X]	Alconox	≤ 5 lbs
[X]	Liquinox	≤ 1 gal
[ ]	Acetone	≤ 1 gal
[ ]	Methanol	≤ 1 gal
[ ]	Hexane	≤ 1 gal
[ ]	Isopropyl alcohol	≤ 4 gal
[ ]	Nitric acid	≤ 1 L
[ ]	Other:	

	Calibration	Qty.
[ ]	Not applicable	
[X]	Isobutylene/air	1 cyl
[ ]	Methane/air	1 cyl
[ ]	Pentane/air	1 cyl
[ ]	Hydrogen/air	1 cyl
[ ]	Propane/air	1 cyl
[ ]	Hydrogen sulfide/air	1 cyl
[ ]	Carbon monoxide/air	1 cyl
[X]	pH standards (4,7,10)	≤ 1 gal
[X]	Conductivity standards	≤ 1 gal
[X]	Other:	
	ORP Standard	< 1 gal

	Fuels	Qty.
[ ]	Not applicable	
[X]	Gasoline	≤ 5 gal
[X]	Diesel	≤ 5 gal
[ ]	Kerosene	≤ 5 gal
[ ]	Propane	1 cyl
[ ]	Other:	

	Kits	Qty.
[X]	Not applicable	
[ ]	Hach (specify):	1 kit
[ ]	DTECH (specify):	1 kit
[ ]	Other:	1 kit

	Remediation	Qty.
[X]	Not applicable	
[ ]		
[ ]		
[ ]		
[ ]		
[ ]		

	Other:	Qty.
[ ]	Not applicable	
[X]	Spray paint	≤ 6 cans
[ ]	WD-40	≤ 1 can
[ ]	Pipe cement	≤ 1 can
[ ]	Pipe primer	≤ 1 can
[ ]	Mineral spirits	≤ 1 gal

	DOT(1):	Qty.
[ ]	MOT eligible soils	
[ ]	MOT eligible water	
[ ]	MOT eligible solids	
[ ]	MOT eligible liquids	
[ ]		
[ ]		
[ ]		

(1) Attach applicable Materials of Trade (MOT) generic shipping determination. SDS not generally applicable to this category.

Copy any pre-populated text in this field and paste as values then add desired text to this field.

Contractor SDSs will be submitted to Arcadis in advance of work and will be filed with Arcadis SDSs as indicated above.

This project will not be utilizing materials subject to the HAZCOM Standard in bulk storage. In this HASP, bulk storage means any material stored on the project site in a bulk packaging >119 gallons (> 450 L) liquid capacity or a palletized quantity of a material in packagings ≤119 gallons (≤450 L) liquid capacity.

Air Monitoring

☐ There are no atmospheric chemical, radiological, or particulate hazards on this project requiring air monitoring.
☐ Air monitoring is the responsibility of the client or subcontractor.

Constituents of Interest:

Time Weighted Averages (TWAs) are ACGIH 8-Hr Threshold Limit Values (TLVs) unless noted.

Ethylbenzene			
TWA	20 ppm	LEL/UEL (%):	0.8/6.7
STEL	125 ppm	VD (Air = 1):	NA
IDLH	800 ppm, NIOSH	VP (mmHg):	7
Toluene			
TWA	20 ppm	LEL/UEL (%):	1.1/7.1
STEL	150 ppm, NIOSH	VD (Air = 1):	NA
IDLH	500 ppm, NIOSH	VP (mmHg):	21
Xylenes			
TWA	100 ppm	LEL/UEL (%):	1.1/7.0
STEL	150 ppm	VD (Air = 1):	NA
IDLH	900 ppm, NIOSH	VP (mmHg):	9
Naphthalene			
TWA	10 ppm, skin	LEL/UEL (%):	0.9/5.9
STEL	NA	VD (Air = 1):	NA
IDLH	250 ppm, NIOSH	VP (mmHg):	0.08
MIBK			
TWA	20 ppm	LEL/UEL (%):	1.2/8.0
STEL	75 ppm	VD (Air = 1):	NA
IDLH	500 ppm, NIOSH	VP (mmHg):	16
Trichloroethene			
TWA	10 ppm	LEL/UEL (%):	8/10.5
STEL	25 ppm	RGD (Air = 1):	NA
IDLH	1000 ppm, NIOSH	VP (mmHg):	58

TWA - Time Weighted Average (ACGIH TLV unless noted)
STEL - Short Term Exposure Limit
IDLH - Immediately Dangerous to Life and Health
LEL/UEL - Lower /Upper Explosive Limit
RGD - Relative Gas Density
VP - Vapor Pressure

Notes:
One or more constituents above is listed with a skin notation. Avoid conditions where dusts, mists, or aerosols are created. Avoid skin contact with impacted media.

Required Monitoring Instruments, Action Levels and Monitoring Frequency

Gray fields below are not automated. Make necessary selections from drop down menus.

Photoionization Detector — Select Lamp: 10.6 eV

Computed action levels (PID units) (1):			Computed action levels have been manually adjusted.
<	16.1		Continue working
	16.1 - 32.2		Levels sustained > 5 minutes, monitor continuously and review engineering controls and PPE. Proceed with caution.
>	32.2		Stop work and contact SSO

(1) Computed action levels are for PIDs which have not been programmed to correct TLVs for specific constituents or mixtures.

Particulate/aerosol monitoring is not required. Re-evaluate if visible dusts or aerosols cannot be controlled.

Action levels are in mg/m3			Computed action levels have been manually adjusted.
<	NA		Continue working
	NA		Levels sustained > 5 minutes, monitor continuously and review engineering controls and PPE. Proceed with caution.
>	NA		Stop work and contact SSO

Breathing zone air monitoring using the above instruments will be performed at the following frequency:
Select

Multigas (including LEL/O2 and Hg vapor) monitoring is not required.

LEL/O2 Meter	0-5% LEL	Continue work
LEL/O2 Monitoring Not Required	>5-10% LEL	Continually monitor, review engineering controls, proceed with caution
	>10% LEL	Stop work, evacuate, contact SSO
	19.5%-23.5% O2	Normal, continue work
	<19.5% O2	O2 deficient, stop work, evacuate, contact SSO
	>23.5% O2	O2 enriched, stop work, evacuate, contact SSO

Additional Gas/Vapor Monitoring is Not Required

		1/2 TLV	Stop Work Action Level	Comments
☐	Ammonia	12.5 ppm	25 ppm	
☐	Carbon dioxide	2500 ppm	5000 ppm	
☐	Carbon monoxide	12.5 ppm	25 ppm	
☐	Chlorine	0.05 ppm	0.1 ppm	
☐	Hydrogen cyanide	2.35 ppm (skin)	4.7 ppm* (skin)	
☐	Hydrogen sulfide	0.5 ppm	1 ppm	
☐	Nitrogen dioxide	0.1 ppm	0.2 ppm	
☐	Phosphine	0.025 ppm	0.05 ppm	
☐	Sulfur dioxide	0.125 ppm	0.25* ppm	
☐	Mercury vapor	0.0125 mg/m3	0.025 mg/m3	

* Ceiling or STEL value

All air-monitoring instruments must be calibration checked daily, if used, per manufacturer's instructions. Calibration checks, including calibration gases used, must be documented.

Compound specific monitoring using indicator tubes or chips is not required.

Indicator:		≤TWA	Continue work
☐ Tube	☐ Chip	>TWA	Stop work, review engineering controls and PPE, contact SSO
Compound(s):			

Indicator tube/chip monitoring frequency: Not applicable

Air Monitoring

Task or Area of Concern: **Drilling or Soil Borings in Proximity to Building 458 and CHAPA**

Constituents of Interest:

Time Weighted Averages (TWAs) are ACGIH 8 Hr Threshold Limit Values (TLVs) unless noted.

Methylene chloride			
TWA	50 ppm, OSHA Reg. See Notes	LEL/UEL (%):	13/23
STEL	100 ppm	VD (Air = 1):	NA
IDLH	2300 ppm, NIOSH	VP (mmHg):	350
Toluene			
TWA	20 ppm	LEL/UEL (%):	1.1/7.1
STEL	150 ppm, NIOSH	VD (Air = 1):	NA
IDLH	500 ppm, NIOSH	VP (mmHg):	21
Xylenes			
TWA	100 ppm	LEL/UEL (%):	1.1/7.0
STEL	150 ppm	VD (Air = 1):	NA
IDLH	900 ppm, NIOSH	VP (mmHg):	9
Ethylbenzene			
TWA	20 ppm	LEL/UEL (%):	0.8/6.7
STEL	125 ppm	VD (Air = 1):	NA
IDLH	800 ppm, NIOSH	VP (mmHg):	7
Naphthalene			
TWA	10 ppm, skin	LEL/UEL (%):	0.9/5.9
STEL	NA	VD (Air = 1):	NA
IDLH	250 ppm, NIOSH	VP (mmHg):	0.08
MIBK			
TWA	20 ppm	LEL/UEL (%):	1.2/8.0
STEL	75 ppm	RGD (Air = 1):	NA
IDLH	500 ppm, NIOSH	VP (mmHg):	16
Trichloroethene			
TWA	10 ppm	LEL/UEL (%):	8/10.5
STEL	25 ppm	RGD (Air = 1):	NA
IDLH	1000 ppm, NIOSH	VP (mmHg):	58

TWA - Time Weighted Average (ACGIH TLV unless noted)
STEL - Short Term Exposure Limit
IDLH - Immediately Dangerous to Life and Health
LEL/UEL - Lower/Upper Explosive Limit
RGD - Relative Gas Density
VP - Vapor Pressure

One or more constituents above is listed with a skin notation. Avoid conditions where dusts, mists, or aerosols are created. Avoid skin contact with impacted media.

As noted, one or more of the above constituents is an OSHA regulated substance. If exposure is expected to be above the TWA, contact a CIH or CSP for assistance unless otherwise permitted by a substance specific plan template identified in this section.

Required Monitoring Instruments, Action Levels and Monitoring Frequency

Gray fields below are not automated. Make necessary selections from drop down menus.

Photoionization Detector Select Lamp: 11.7 eV

Methylene Chloride Drager Tube tests should be conducted when PID readings are identified at 10 ppm or greater.

Action levels are in PID units (1):		X	Computed action levels have been manually adjusted.
<	5.0		Continue working
	5.0 - 10.0		Levels sustained > 5 minutes, monitor continuously and review engineering controls and PPE. Proceed with caution.
>	10.0		Stop work and contact SSO

Standard 4 Gas Monitoring (LEL,O2,H2S,CO) with a multigas meter is required

LEL/O2 Meter	0-5% LEL	Continue work
	>5-10% LEL	Continually monitor, review engineering controls, proceed with caution
	>10% LEL	Stop work, evacuate, contact SSO
Monitoring Required	19.5%-23.5% O2	Normal, continue work
	<19.5% O2	O2 deficient, stop work, evacuate, contact SSO
	>23.5% O2	O2 enriched, stop work, evacuate, contact SSO

Checked gases require monitoring:

		1/2 TLV	Stop Work Action Level
	Ammonia	12.5 ppm	25 ppm
	Carbon dioxide	2500 ppm	5000 ppm
X	Carbon monoxide	12.5 ppm	25 ppm
	Chlorine	0.05 ppm	0.1 ppm
	Hydrogen cyanide	2.35 ppm (skin)	4.7 ppm* (skin)
X	Hydrogen sulfide	0.5 ppm	1 ppm
	Nitrogen dioxide	0.1 ppm	0.2 ppm
	Phosphine	0.025 ppm	0.05 ppm
	Sulfur dioxide	0.125 ppm	0.25 ppm
	Mercury vapor	0.0125 mg/m3	0.025 mg/m3

Comments

Use a multigas meter equipped with a sensor(s) capable of detecting checked gases identified to the right. Review engineering controls and perform continuous monitoring with data logging at concentrations >1/2 TLV. Stop work action levels are based on Level D protection.

* Ceiling or STEL value

All air-monitoring instruments must be calibration checked daily, if used, per manufacturer's instructions. Calibration checks, including calibration gases used, must be documented.

Compound Specific Monitoring is Required

Indicator:	**≤TWA**	**Continue work**
X Tube Chip	**>TWA**	**Stop work, review engineering controls and PPE, contact SSO**
Compound(s): Methylene Chloride		

Indicator tube/chip monitoring frequency: >PID/FID action level at 15 minute intervals

Respiratory Protection Plan
Revision 9, 8/16/2018
Level C/B Scope of Work

Describe the task(s) requiring Level C upgrade:
Monitoring/Soil Vapor well installation in proximity to Building 458 and CHAPA where mechanical ventilation is not sufficient to control Methylene Chloride concentrations below the action level.

IF LEVELS ARE IDENTIFIED OVER THE ACTION LIMIT, STOP WORK!
NO LEVEL B WORK IS AUTORIZED UNDER THIS HASP

Comments:
Review SDS for methylene chloride and include symptoms of exposure during tailgate topic during drilling days.

Air monitoring equipment shall be acquired in accordance with the HASP monitoring requirements and calibrated daily before work.

Mechanical fans shall be deployed to the work areas and shall be run. An exclusion zone of 50' surrounding the work area shall be established, and personnel not associated with the drilling shall keep out and monitor for 3rd party traffic in the area. IF 3rd party traffic approaches, the work will be shut down.

The breathing space shall be continuously monitored using a PID (with an 11.7eV bulb) in accordance with the HASP (Tab 7a), and a MC specific Draeger tube (at 15 minute intervals) during the first hour of drilling. If background readings within that first hour do not reach the AL, Drager tube frequency may be reduced to hourly. IF action levels are exceeded with the PID, Draeger tubes will be used to monitor breathing space at 15 minute intervals. If the action level is reached (10ppm), work shall cease and the project team shall contact Corporate H&S to plan for Level B work. In the event that rain interferes with the PID readings, Draeger tubes will be used in lieu of the PID, and shall be drawn at 15 minute intervals.

Verify the following (check box if condition ***does not exist*** *for the task(s) listed above):*

X	NO IDLH atmospheres
X	NO oxygen deficient atmospheres
X	NO permit required confined spaces
X	NO unknown contaminant atmospheres

If any of the above conditions exist, contact your project H&S contact for assistance.
- Contacted Alec McAdam 8/27/2019

Roles and Responsibilities

Identify project team members and Level C responsibilities for each member for this work:

	Employee Name	Responsibilities
1	See Staff List in HASP	
2		
3		
4		
5		
6		
7		
8		

Training

The following training is required beyond the training specified in the HASP:

X	Respirator use and limitations
X	Level C/B PPE specific to the project
X	Site control specific to the project
X	Decontamination specific to the project.
X	Project air monitoring requirements under Level C
X	Emergency Action Plan specific to this Level C project
	Other (specify):
	Other (specify):

Training will be provided on site prior to initiation of work and documented on:

X	Tailgate Safety Briefing Form
	Field Logbook
	Permit
X	Other (specify): Project Files

Medical Surveillance

X	All project team members have a current medical clearance to wear a respirator.
	The following project team members are required to have a current medical clearance to wear a respirator:

Air Monitoring Supplement

The following air monitoring requirements are in addition to the requirements in the HASP when work is performed under Level C conditions.

Constituent(s)		Odor Threshold (ppm)	Full Facepiece APR MUC QLFT (ppm)	Full Facepiece APR MUC QNFT (ppm)
Methyl chloride	<=	10.2	500	2500
None		NA	9999	9999
None		NA	9999	9999
None		NA	9999	9999
None		NA	9999	9999
None		NA	9999	9999

WARNING! Constituents identified above require use of a supplied air respirator. Contact Corporate H&S, CIH or CSP for assistance.

Other air monitoring equipment required for Level C work not specified in the HASP:

X	1) PID	X	7) Weather:		
X	2) FID	X	Temperature	X	Wind direction
X	3) LEL/O2 Meter		Humidity	X	Wind speed
	4) Particulate monitor	X	Precipitation		Other:
X	5) Colorimetric indicator tubes (specify type):	Methylene Chloride 20 ppm-200ppm			
	6) Other:				

Air monitoring will be conducted at (check all that apply):

	Location:	Frequency:	Specify Instruments (# from above)
X	Breathing zone	Continuously during Intrusive	PID/FID/4 Gas Meter
	Exclusion zone boundary		
X	Upwind	Continuously during Intrusive	PID/FID/4 Gas Meter
X	Downwind	Continuously during Intrusive	PID/FID/4 Gas Meter
	Crosswind		
	Site perimeter		
	Other:		

☐ A windsock is required.

Comments:

Respirator Selection and Fit Testing **- NA For Methylene Chloride, SCBA Only**

The following respirator is required for this project:

		APF	Permitted Fit Test
☐	Disposable dust mask	5	QLFT
☐	Half facepiece air purifying respirator (dual cartridge)	10	QLFT
☐	Full facepiece air purifying respirator	10	QLFT
☐	Full facepiece air purifying respirator	50	QNFT
☐	Loose fitting facepiece powered air purifying respirator	25	QLFT
☐	Half facepiece powered air purifying respirator	50	QLFT
☐	Full facepiece powered air purifying respirator	1000	QNFT

Required fit test for project: ☐ Qualitative (QLFT) ☐ Quantitative (QNFT)
☐ QLFT fit test protocol attached

Cartridge Selection **- NA For Methylene Chloride**

The following cartridges are required for this project:
Note: Consult the manufacturer's literature for specific constituents of interest to ensure correct cartridge is selected.

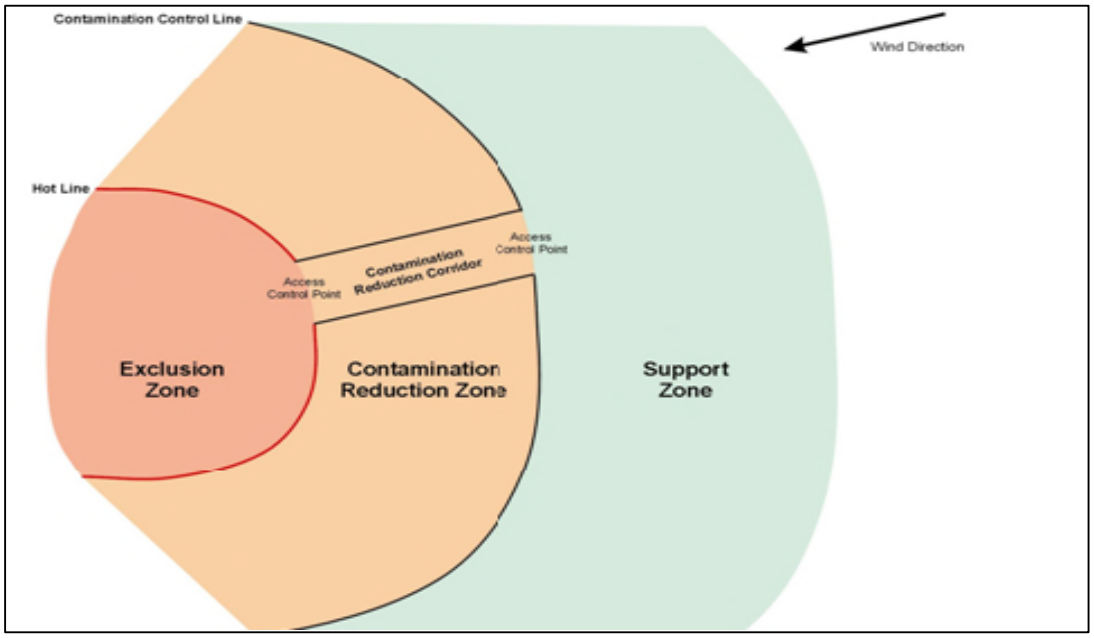
Respirator Care and Maintenance

☒ Cleaning protocol attached

All respirators will be stored in a clean and sanitary condition at all times. Each respirator used will be cleaned prior to be stored for the day. Each respirator will be inspected by the user prior to use. Any defective or worn part will be promptly replaced.

Site Control

Example site control layout (check configurations to be used below):



The size and configuration used for site control is dependent on many variables. Based on work being performed, identify site control requirements for this project:

Configuration?		How delineated?	
X	Exclusion zone (EZ)		Cones
X	Contamination reduction zone (CRZ)		Channelizer cones
	Contamination reduction corridor (CRC)	X	Caution tape
X	Access control points (ACPs)		Safety fencing
	Other:		Other:
	Other:		Other:

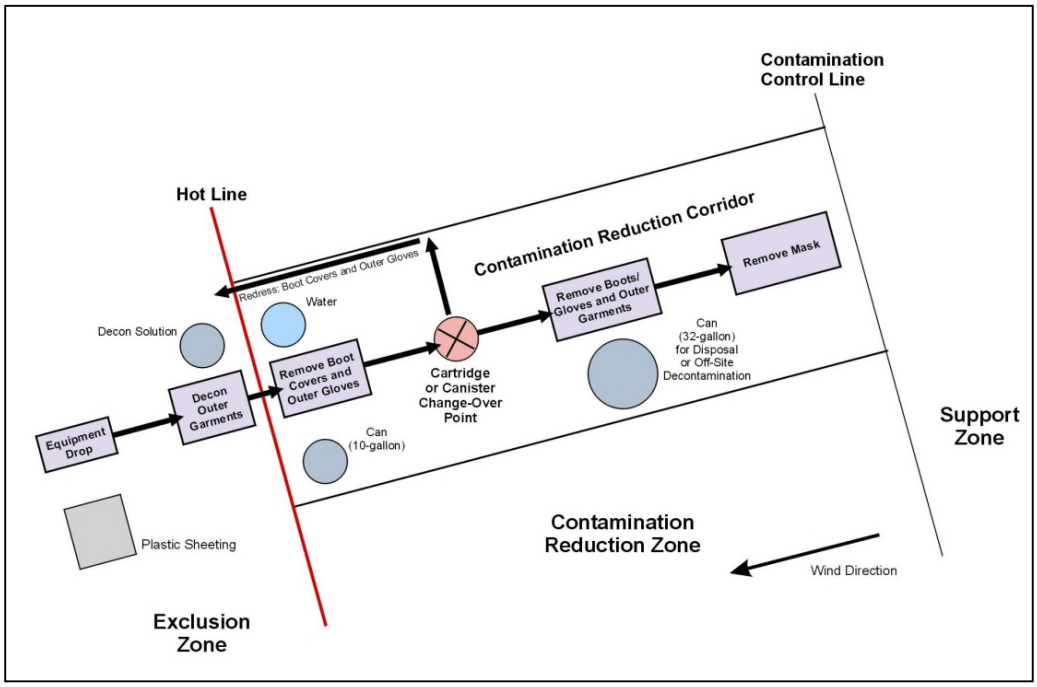
Site control is integrated into the STAR Plan or TCP for the project

Additional Level C PPE specific for each zone (excluding respirator):

EZ and ACP at EZ		CRZ/CRC/ACP at Support Zone		Support Zone	
X	Coveralls:	X	Coveralls:	X	See applicable JSA
X	Boot covers:	X	Boot covers:	X	See HASP
X	Outer gloves:		Outer gloves:		Other:
X	Inner gloves:	X	Inner gloves:		
X	Taping		Taping		
	Other:		Other:		
	Other:		Other:		

Decontamination

Example decontamination layout (check stations and supplies required below):



The number of stations required for decontamination is dependent on many variables. Based on work being performed, identify decontamination stations and supplies required for this project:

Station:	Zone:	Supplies:		Number:
X Equipment drop	EZ	X	Plastic containers	1
		X	Plastic liners/bags	1
		X	Plastic sheeting (rolls)	1
X Outer garment decon	EZ	X	Containers (20-30 gallon)	1
		X	Decon solutions (gallons)	1
		X	Rinse water (gallons)	1
		X	Long handled scrub brushes	1
X Boot cover/outer glove removal	CRZ	X	Containers (20-30 gallon)	1
		X	Plastic liners/bags	1
		X	Bench or stools	1
X Cartridge/ Tank change out	CRZ	X	Spare cartridges (sets)	1
		X	Tape	1
		X	Boot covers (pair)	1
		X	Gloves (pair)	1
X Boot/glove/outer garment remov	CRZ	X	Containers (20-30 gallon)	1
		X	Plastic liners/bags	1
		X	Bench or stools	1
X Mask Removal	CRZ	X	Plastic sheeting (rolls)	1
		X	Buckets	1
		X	Soap	1
		X	Water (gallons)	1
		X	Paper towels (rolls/boxes)	1

Attachment A. Respirator Cleaning Protocol

Disposable dust masks will not be decontaminated or disinfected and will be disposed after use. For other types of respirators, the following cleaning and disinfecting procedure will be used:

1) Remove cartridges/canisters/filters. Disassemble facepiece by removing speaking diaphragm, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer.
2) Wash components with warm (<110° F) water with a mild detergent or with a cleaner approved by the manufacturer. A soft, non-wire bristle brush may be used to facilitate dirt removal.
3) Rinse with warm (<110° F) clean water, preferably running water.
4) If the cleaner used does not contain a disinfecting agent, respirator components should be immersed in one of the following for two minutes:
   a) Hypochlorite solution (50 ppm chlorine) made by adding approximately 1 milliliter of laundry bleach to 1 liter of water at 110° F; or
   b) Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine [6-8 grams ammonium and/or potassium iodide/100 cubic centimeters (cc) of 45 percent alcohol] to one liter of water at 110° F; or
   c) Other commercially available cleansers of equivalent disinfectant quality, when used as directed by the manufacturer, and are approved for use by the respirator manufacturer.
5) Thoroughly rinse the respirator components in clean, warm, (<110° F) running water.
6) Components should be hand dried with a soft lint free cloth or allowed to air dry.
7) Reassemble the facepiece and restore cartridges/canisters/filters as necessary.
8) Test the respirator for proper working condition.

Personal Protective Equipment (PPE)

See JSA or Permit for the task being performed for required PPE. If work is not conducted under a JSA or Permit, refer to the governing document for PPE requirements. At a minimum, the following checked PPE is required for all tasks during field work (outside of field office trailers and vehicles) not covered by a JSA or Permit on this project:

Minimum PPE required to be worn by all staff on project:

						Specify Type:
X	Hard hat		Snake chaps/guards		Coveralls:	
X	Safety glasses		Briar chaps		Apron:	
	Safety goggles		Chainsaw chaps	X	Chem. resistant gloves:	Nitrile
	Face shield		Sturdy boot	X	Gloves other:	Leather or ANSI Cut 2
X	Hearing protection	X	Steel or comp. toe boot		Chemical boot:	
	Rain suit		Metatarsal boot		Boot other:	
	Other:			X	Traffic vest, shirt or coat:	Class II
					Life vest:	

Task specific PPE:
Comments:

Medical Surveillance

All Arcadis employees and subcontractors performing field work will be required to be current in HAZWOPER medical surveillance.

Client and DOT mandated drug and alcohol testing is not required for this project and will not be performed.

Hazardous Materials Shipping and Transportation

A shipping determination package has been prepared, reviewed and provided to Arcadis field staff for this project.

Traffic Safety and Traffic Safety Plans (TSPs)

Enter desired text in this field.

Arcadis Commercial Motor Vehicles (CMVs)

CMVs operated by Arcadis employees on public roadways will not be utilized on this project. Arcadis defines a CMV as any single vehicle with a gross vehicle weight rating (GVWR) ≥10,001 pounds or a truck and trailer combination with a combined GVWR ≥10,001 pounds (GVWR of truck + GVWR of trailer = ≥10,001 pounds).

Site Control

Site control requirements are integrated into the TSP for this project.

Decontamination

Task specific decon procedures will be detailed in task specific JSAs where required.

Sanitation

Restroom facilities and potable water will be provided by the client for this project. Unless alternate requirements are stipulated in a plan supplement (i.e. Heat Injury and Illness Prevention Plan), permit or JSA, temporary restroom facilities will be provided with one toilet for every 20 project workers and bottled or non-plumbed potable water will be provided to project workers at 1 gallon/worker/day.

Safety Briefings

Arcadis will lead all safety briefings on this project and will document the safety briefing on a Tailgate Safety Briefing form or logbook. Safety briefings will be conducted once at the beginning of each work day unless the Site Safety Officer deems more frequent safety briefings will be required based on work being conducted. All project workers, including Arcadis subcontractors, will be required to attend the safety briefing. Site visitors and project workers not on duty during the morning safety briefing will receive the safety briefing upon their arrival onto the project site for the day.

Employee Health and Safety Engagement

The CPM or APM is responsible for reviewing and establishing H&S engagement goals for the project. These goals are summarized below.

Hazard Observations (via H&S App or TIP) required at the following frequency on this project:
1 per task
Close Call reporting (via H&S app) goals for this project:
1 NM per event
Other (specify):

Safety Equipment and Supplies

Safety equipment/supply requirements are addressed in the JSA or Permit for the task being performed. If work is not performed under a JSA or Permit, the following safety equipment is required to be present on site in good condition unless otherwise noted (Check all that apply):

X	First aid kit	**Class B, Type 3**		Insect repellent:
X	Bloodborne pathogens kit		X	Sunscreen
X	Fire extinguisher	**10# ABC**		Air horn
	Eyewash (ANSI compliant)		X	Traffic cones
X	Eyewash (bottle)			2-way radios
X	Drinking water			Heat stress monitor
X	Other:			Poisonous plant pre/post exposure lotion/soap
	Cell Phone			

Control of Ticks and Poisonous Plants

Work on this project has a low tick exposure hazard. Use of inspect repellent (DEET and/or permethrin) is recommended. Wear light colored clothing to help identify presence of ticks on staff. Keep shirt tails inside pants.

Work on this project has a low poisonous plant exposure hazard. First aid kits should be equipped with post exposure soap as a precaution. Inspect work area for presence of hazard prior to initiating work at the location. Wear disposable gloves during work and while removing outer footwear.

International Travel

International travel is not required for this project.

Spill Control and Containment

Spill control and containment planning and implementation is not required for this project.

Use of Electronic Devices in Areas of Increased Safety Risk

The intent of this section is to ensure use of standard computer tablets, laptops, or cell phones (collectively referred to in this HASP as a digital device) is performed in a manner that is effective in preventing or mitigating injury to the user of the digital device.

Use of electronic devices in an active parking lot must be addressed in the Non-ROW TSP. Use of Non-ROW short-term traffic controls in situations where digital data collection or documentation is conducted should be avoided unless spotter options are utilized. When practical, use project vehicle as shield in parking lots.

Electronic device use and distractions to be discussed and documented in the job briefing/safety briefing.

Signatures

I have read, understand and agree to abide by the requirements presented in this health and safety plan. I understand that I have the absolute right to stop work if I recognize an unsafe condition affecting my work until corrected.

Printed Name	Signature	Date

Add additional sheets if necessary

You have an absolute right to STOP WORK if unsafe conditions exist!

ATTACHMENT A

COVID-19 Prepardness, Response and Continuity Plan

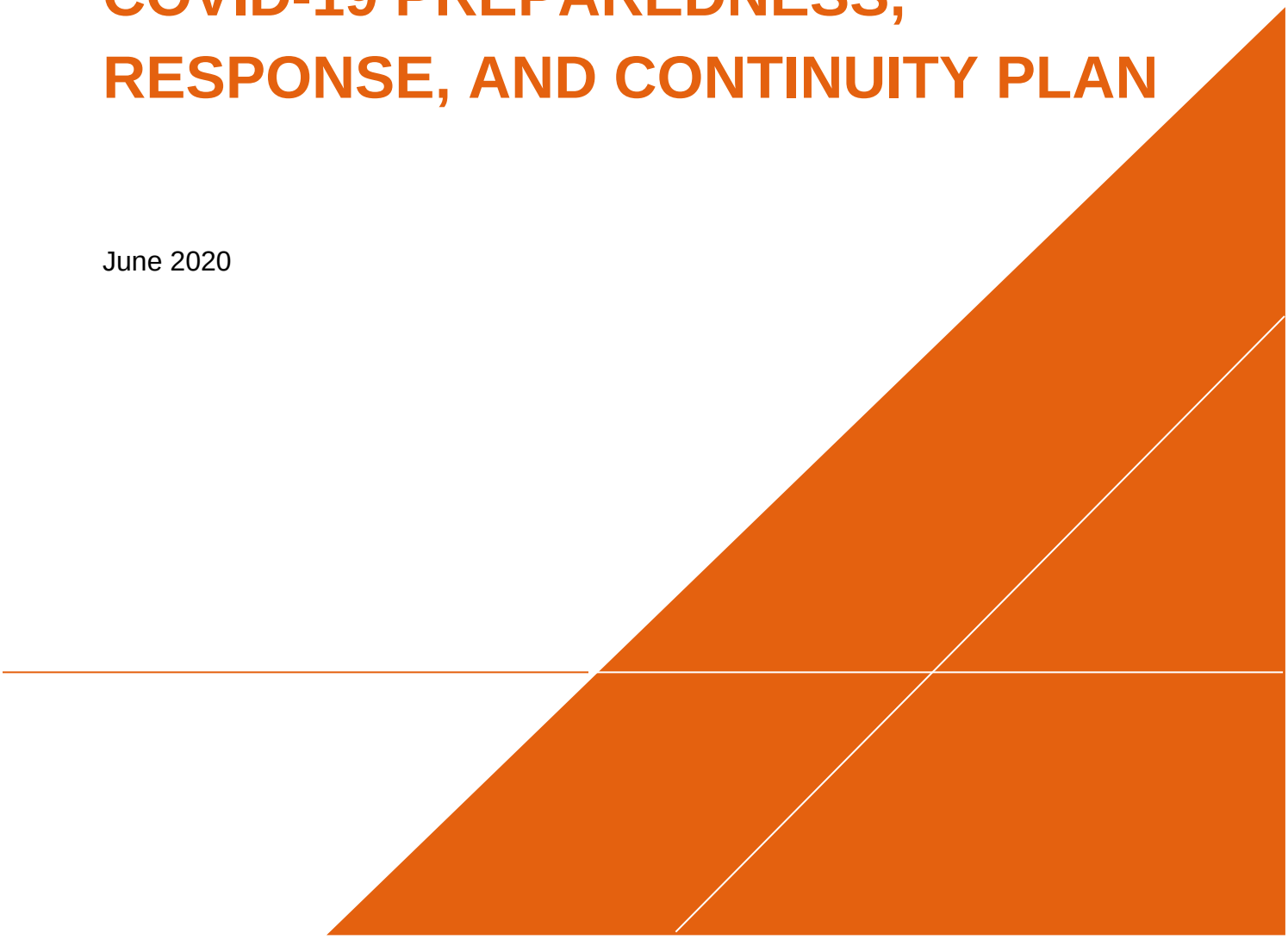
ARCADIS Design & Consultancy for natural and built assets

Bristol Myers Squibb Company

BDA PROGRAM FIELD ACTIVITIES

COVID-19 PREPAREDNESS, RESPONSE, AND CONTINUITY PLAN

June 2020



VERSION CONTROL

Revision No.	Date Issued	Description
1		Original document.

SIGNATURES

I have read, understand, and agree to abide by the requirements presented in this COVID-19 Continuity Plan. I understand that I have the absolute right to stop work if I recognize an unsafe condition affecting my work until corrected.

Name Printed	Signature	Date

CONTENTS

1 Introduction 1
2 COVID-19 Health Screening Self-Assessments 1
2.1 COVID-19 Health Screening Self-Assessment Decision Process 2
3 Project-Specific Considerations 2
3.1 Site Entry and Exit 2
3.2 Field Trailer/Office or Other Indoor Common Space 2
3.3 Personal Protective Equipment/Face Coverings 2
3.4 Restroom and Hand Washing Facilities 3
3.5 Cleaning and Disinfecting 3
3.6 Tailgate Safety Meetings or Other On-Site Meetings 3
3.7 Site Visitors 4
3.8 Planned Tasks 4
3.9 Shared Equipment/Items 4
4 Jusdictional Requirements 4

ATTACHMENTS

Attachment 1 Arcadis COVID-19 Guidance for Field and Embedded Staff
Attachment 2 Jurisdictional Requirements
Attachment 3 CDC Guidance on Disinfecting Surfaces
Attachment 4 COVID Health Screening Questionnaire – Arcadis Staff, Contractors & Anticipated Visitors
Attachment 5 COVID-19 Flow Chart on Yellow Caution Status Guidance

1 INTRODUCTION

In light of the COVID-19/CV-19/Coronavirus pandemic, this plan has been prepared collaboratively by Bristol-Myers Squibb Company and Arcadis to provide guidance for the protection of site personnel and the public by establishing measures and procedures to be followed. This program should be used along with applicable:

- COVID-19 Field and Embedded Staff Guidance (Attachment 1)
- NYS and Onondaga County Restrictions and Requirements (Attachment 2)
- Bristol-Myers Squibb Company EHS Rules and Requirements and OSHA Standards
- CDC Guidelines (Attachment 3)
- World Health Organization Guidelines

Arcadis staff, joint venture partners, Arcadis subcontractors and other under Arcadis supervisor or control must be familiar with and follow this plan at a minimum.

This plan will act as a “living document” and as such will be subject to updates. As noted above, this plan incorporates Federal, State, local, and contractor updates on the virus by reference and as such is not intended to serve as a resource for up-to-date information concerning the virus that may otherwise be conveyed by these entities having jurisdiction. This plan will be provided to site personnel for review and acknowledging they understand the plan contents and details. Plan updates will be provided to site personnel and will be documented and tracked on the cover page.

Arcadis staff, joint venture partners, and Arcadis subcontractors are empowered to use TRACK to evaluate individual situations and Stop Work anytime safety is at risk.

Anyone, including planned and unplanned visitors, entering the project site must complete the COVID-19 Health Screening Self-Assessment Questionnaire prior to each visit and will not come to the project site if they are not feeling well.

2 COVID-19 HEALTH SCREENING SELF-ASSESSMENTS

All personnel working at or visiting the site must complete the COVID-19 Health Screening Self-Assessment Questionnaire prior to each visit. Arcadis staff can use the H&S App to complete their daily (or multiple times a day, if appropriate) COVID-19 Health Screening Self-Assessment (Attachment 4). The data entered into the H&S App COVID-19 Health Screening Self-Assessment form is not stored.

The COVID-19 Health Screening Self-Assessment Questionnaire must be distributed to scheduled visitors, clients, contractors, and subcontractors before visiting the site. Post the self-assessment questionnaire at entrances and/or field trailers, including the sign-in sheet location at the office trailer.

While making efforts to minimize our visitors on Site, all visitors (staff, subcontractors, clients, anticipated guests, unanticipated guests) to the site must be asked to review the applicable questionnaire. The most current versions can be found on the H&S Forms & Templates page (Canada and U.S.)

Section 2.1 of the Arcadis COVID-19 Field and Embedded Staff Guidance presents information about taking temperature measurement.

2.1 COVID-19 Health Screening Self-Assessment Decision Process

Refer to the COVID-19 Health Screening Self-Assessment Questionnaire Flow Chart for guidance on how to address "yes" responses within the attached questionnaire.

If response to questions results in a yellow "Caution" within the H&S App or answers to questions number 3 and 4 only in the hard copy format are yes, refer to the attached "H&S App Yellow Caution Status Guidance" (Attachment 5).

3 PROJECT-SPECIFIC CONSIDERATIONS

Arcadis has directed all employees who can complete their work duties remotely to do so. Through Location Leader communications and the COVID-19 Guidance for Field and Embedded Staff, Arcadis has reinforced social distancing by maintaining separation of at least 6 feet (2 meters) while working at project sites. Using the hierarchy of controls, tasks will be planned to maximize social distancing by implementing engineering and administrative controls before resorting to PPE.

3.1 Site Entry and Exit

Prior to arrival at the Bristol-Myers Squibb facility, Arcadis will provide Anne Locke of BMS with the names of all staff and subcontractor personnel that will need to access the site along with any required information to pre-clear each staff member for processing through the security office upon arrival.

All contractors that need to perform wok on the BMS facility grounds must first complete a required safety training video detailing the EHS rules and expectations regarding conduct on the grounds. Contractors are required to retain and present the Contractor Safety Card issued to them each time they sign in at the security office.

Contractors must sign out at the security office and return the contractor ID badge prior to leave the facility at the end of the day.

3.2 Field Trailer/Office or Other Indoor Common Space

Although a field trailer/office is not anticipated in conjunction with any currently planned activities, access to any field trailer/office which may be mobilized to facilitate future work activities will be limited to the number of people that can safety occupy the space while maintaining required social distancing requirements.

Avoid congregating during breaks.

3.3 Personal Protective Equipment/Face Coverings

All personal will wear face covering at all times they are outside their vehicles on the plant grounds as a means to reduce the risk of transmission of the virus to others. While anyone that has reason to believe

they may have been infected with the virus should not enter the site, given the concern that an individual can have the virus with no symptoms, the requirement to covering is a reasonable precautionary requirement.

In addition, gloves should be worn while completing most activities. Select the appropriate glove for the task. Before using nitrile gloves as personal protective equipment (PPE), make sure to:

- Wash and dry your hands before and immediately after using gloves.
- Understand how to put nitrile gloves on and take them off (refer to The Orange Line article).
- Nitrile gloves offer protection against common consumer cleaning supplies, chlorinated solvents, and offer good dexterity and sensitivity.
- Change gloves between tasks or wash gloved hands with soap and water between tasks.
- Do not touch your face.
- Inspect gloves frequently for signs of wear and replace, as necessary.
- Understand limitations of nitrile gloves.

3.4 Restroom and Hand Washing Facilities

Portable restroom and handwashing station will be established to support field staff and contractors supporting work at this facility, as needed.

Signs will be posted to require wearing face covering and wash hands following use.

Hand wash stations are intended to serve as the primary measure for cleaning hands. Hand washing stations with soap and water will be located adjacent to the portable restroom.

Hand sanitizer will serve as the secondary measure for cleaning hands. Hand sanitizer will also be available.

3.5 Cleaning and Disinfecting

Supplies will be available for routine cleaning of commonly touched surfaces.

Cleaning and disinfection of frequently touched surfaces will be completed routinely, consistent with the schedule to be established by the field supervisor.

3.6 Tailgate Safety Meetings or Other On-Site Meetings

Meetings will be held outdoors where a minimum of at least 6 feet (2 m) between each person can be maintained. Safety moments should reinforce the completion of self-assessment prior to coming to the site, repeat the self-assessment as needed, social distancing, hand hygiene and routine cleaning/disinfecting as part of daily activities. The Site Safety Officer (SSO) will sign everyone in on the Tailgate form to avoid others touching the form.

3.7 Site Visitors

We will attempt to minimize unexpected visitor access to the work areas. All non-essential workers or expected visitors should be approved by BMS and the SSO prior to the visit. The SSO will sign everyone in on the site visitor log to avoid others touching the form. Site visitor orientation provided by SSO will reinforce the completion of self-assessment prior to coming to the site, repeat the self-assessment as needed, social distancing, hand hygiene and routine cleaning/disinfecting as part of daily activities.

3.8 Planned Tasks

Planned tasks involved with the scheduled site restoration activities will include mobilizing personnel and equipment to the site; ensuring erosion controls are still in place and making repairs, as needed; complete the step agreed to achieve temporary decommissioning of the pilot interceptor trenches; restore rip rap drainage ways located within the trench construction work zone to pre-construction condition; regrade the ground surface throughout the work zone; install top soil and seed the work zone to facilitate establishing a vegetative cover.

3.9 Shared Equipment/Items

Shared equipment will be cleaning and/or disinfection in accordance with established protocol. Refer to the COVID-19 QAQC Disinfection guidance for additional information.

4 JUSDICTIONAL REQUIREMENTS

Jurisdiction-mandated main points are summarized here. Additional information can be found in Appendix B.

The mandatory requirements included in the Reopening New York Construction Guidelines for Employers and Employees include the following:

- Physical Distancing
- Protective Equipment
- Cleaning and Hygiene
- Communication
- Screening

The requirements established in the COVID-19 Guidance for Field and Embedded Staff presented in Appendix A also addresses each of these requirements.

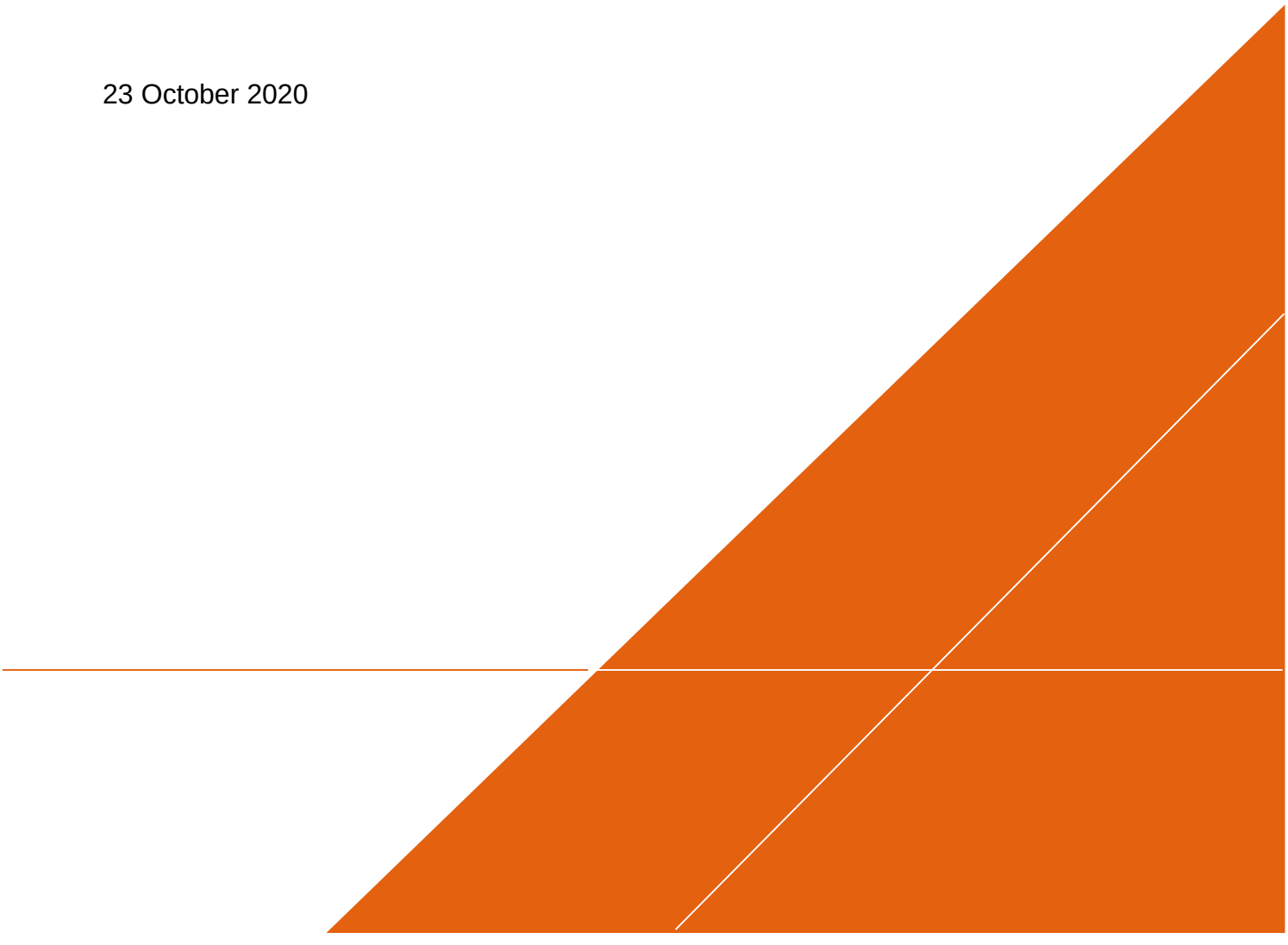
ATTACHMENT 1

Arcadis COVID-19 Guidance for Field and Embedded Staff

ARCADIS Design & Consultancy for natural and built assets

ARCADIS FIELD AND EMBEDDED STAFF COVID-19 GUIDANCE

23 October 2020



VERSION CONTROL

Revision No.	Date Issued	Description
1	3/17/20	Original document.
2	3/20/20	Added guidance for multiple occupants traveling in the same vehicle.
3	3/24/20	Updated introduction to include links to Orange Line information; added requirement of Arcadis COVID-19 Health Screening Self-Assessment Questionnaires; moved client questionnaire section forward in the document; and made minor updates to the social distancing, vehicle/transportation, lodging and equipment sections.
4	3/30/20	Updated social distancing section to include CDC “close contact” definition; added section for work in team settings; added AirBnB to lodging discussion.
5	4/2/20	Document template updated and sections rearranged; updated Hand Hygiene section; updated Cleaning of Frequently Touched Surfaces section; updated close contact definition; added section on PPE; added section for Traveling Between States, Provinces and Territories; added section for Construction/Construction Management; added section on Post-Shift Work
6	4/3/20	Added Appendix D – Interim Guidance for the Use of Face Coverings; Updated links, Section 2.3 added bullet to avoid sharing tools and equipment unless cleaned; Section 4.7.2 updated with a bullet for maintaining social distancing at choke points; Section 4.8 added section for Face Coverings and guidance in Appendix D.
7	4/10/20	Added Section 2.8 Other Considerations for journey and emergency action planning; Section 4.6 updated with current information regarding COVID-19 in sewage; Section 4.8 and Appendix D updated to include CDC’s recommends of wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain.
8	4/13/20	Revised Section 2.6 by adding information about gloves being required in some jurisdictions; revised Section 4.8 and Appendix D with latest CDC and Health Canada guidance information.
9	4/20/20	Revised Section 2.1 to discuss both digital and hardcopy COVID-19 Health Screening Self-Assessment Questionnaires; revised Section 2.3.1 to include instructions on alcohol-based hand sanitizer use.
10	4/26/20	Revised Section 2.1 by adding the definition of fever and process for elevated temperature; revised section 2.4 by adding a reminder to understand the appropriate uses and limitations of the disinfectant; revised Section 2.6 by adding link to PPE request form and email address; Section 3.1 added link to “Locations with Travel Restrictions” dashboard; revised Section 3.2 to consider face coverings when multiple occupants are riding in a single vehicle; revised Section 4.2

		adding critical infrastructure/essential worker language; updated hyperlinks
11	5/1/20	Section 1 revised with latest symptoms of COVID-19; Section 2.5 reinforced Stop Work Authority and reporting where social distancing is not being practiced; inserted Interim Guidelines for Cardiopulmonary Resuscitation as Section 2.8 and moved “Other Considerations” to Section 2.9; added a bullet referencing Continuity Plan in Section 2.9
12	5/4/20	Revised Appendix C per jurisdictional updates.
13	6/16/20	Updated symptom list per CDC guidance; revised CDC close contact definition notes (Section 2.4); added plan for breaks bullets in Section 4.2; added Section 4.9 KN95; updated CDC’s face covering laundering recommendations in Appendix D.
14	8/14/20	Updated footnotes for “close contact” definition (Section 2.5); updated Sections 3.1 and 3.3 to reflect current travel recommendations; updated Section 4.8 and Appendix D to indicate exhalation valves or vents should NOT be worn; added links to the Face Covering Guide in Section 4.8.
15	10/23/20	Added Appendix E with additional signage that may be used; added reference to signage (Section 2.3.1); updated social distancing and close contact definitions (Section 2.5); added Yellow Guidance sub bullet (Section 2.7); updated order hyperlink (Section 3.1); added airline and other transportation (Section 3.2); added reporting requirement documentation (Section 4.3); updated Section 4.7.1 to clarify occupancy and documentation of visitors for contact tracing; added guidance to hold meetings outside (Section 4.7.2); minor edits to Section 4.8 and Appendix D.

CONTENTS

1 Introduction 1

2 Guidance for project activities 1

2.1 Arcadis COVID-19 Health Screening Self-Assessment Questionnaires 1

2.1.1 COVID-19 Digital Health Screening Self-Assessment Questionnaire 2

2.1.2 COVID-19 Health Screening Self-Assessment Questionnaire (Hardcopy) 2

2.2 Client COVID-19 Health Screening Forms 3

2.3 Practice Good Hygiene 3

2.3.1 Hand Hygiene 3

2.4 Clean Frequently Touched Surfaces 4

2.5 Practice Social Distancing 5

2.6 Personal Protective Equipment 5

2.7 Reporting a COVID-19 Exposure 6

2.8 Interim Guidelines for Cardiopulmonary Resuscitation 6

2.9 Other Considerations 7

3 Travel Guidance 7

3.1 Traveling Between States, Provinces or Territories 7

3.2 Field Vehicles and Transportation 7

3.3 Lodging Considerations 8

3.4 Rental Equipment and Sample Cooler Handling 8

4 Work-specific situations 8

4.1 Working with Little or No Contact with Others 8

4.2 Working in Project Teams 8

4.3 Embedded Employee Working at a Client Facility 9

4.4 Working in Contact with the Public 10

4.5 Working at Indoor Residential Settings 10

4.6 Projects Involving Drinking Water Systems, Recreational Water and/or Wastewater 10

4.7 Construction Management/Construction 11

4.7.1 Field Trailers 11

4.7.2 Other Construction Guidance 11

4.8 Cloth Face Coverings 12
4.9 KN95 13
5 Post Shift Considerations 13

APPENDICES

Appendix A: Site Signage – Self-Assessment Required

Appendix B: Site Signage – Social Distancing

Appendix C: Jurisdiction-mandated Social Distancing Protocol Example

Appendix D: Interim Guidance for the Use of Face Coverings

Appendix E: Additional Signage

Appendix F: Arcadis Contact Tracing Log

1 INTRODUCTION

Currently Arcadis is following CDC and Health Canada guidelines, as well as applicable government directives. The health and safety of our people is of utmost importance to us. Arcadians are empowered to use TRACK to evaluate individual situations and Stop Work Authority anytime safety is at risk. Employees will not come to work if exhibiting any respiratory illness symptoms, including but not limited to COVID-19.

It is recommended that all field and embedded staff review and have access to the current version of this document. The most current version can be viewed and downloaded from the linked Orange Line article. COVID-19 symptoms may appear 2-14 days after exposure to the virus. People with these symptoms or combinations of symptoms may have COVID-19:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

This list is not all inclusive. Please consult your medical professional for any other symptoms that are severe or concerning to you.

2 GUIDANCE FOR PROJECT ACTIVITIES

Employees should complete the following for all project activities.

2.1 Arcadis COVID-19 Health Screening Self-Assessment Questionnaires

Arcadis staff visiting offices and project sites must complete the COVID-19 Health Screening Self-Assessment Questionnaire prior to each visit. Individuals should continuously monitor for signs and symptoms of COVID-19 and, if not feeling well, complete the COVID-19 Health Screening Self-Assessment Questionnaire again.

When individuals take their own temperature to evaluate whether they have a fever, the temperature measurements will be completed without the use of fever-reducing medicines that contains ibuprofen or acetaminophen and not within 30 minutes of exercise. The CDC defines a fever as a temperature of 100.4°F (38°C) or greater. If the individual's temperature is between 99°F (37.2°C) and 100.3°F (37.9°C)

it is recommended the individual pay close attention for signs and symptoms of COVID-19 and complete the COVID-19 Health Screening Self-Assessment Questionnaire more frequently.

2.1.1 COVID-19 Digital Health Screening Self-Assessment Questionnaire

Arcadis staff can use the H&S App to complete their daily (or multiple times a day, if appropriate) COVID-19 Health Screening Self-Assessment.

Upon completion of the COVID-19 Health Screening Self-Assessment in the H&S App, the user will receive a green, yellow or red completion message:

- Green – proceed to the office or project site
- Yellow (Caution) – critical infrastructure/essential worker must contact the Project Manager and review the "COVID-19 Flow Chart - H&S App Yellow Caution Status Guidance" located on the H&S "Forms and Templates" Intranet page.
- Red – do not proceed to the office or project site

Screenshot the completion message and be prepared to show the screenshot prior to entering project sites and offices.

2.1.2 COVID-19 Health Screening Self-Assessment Questionnaire (Hardcopy)

The COVID-19 Health Screening Self-Assessment Questionnaire must be:

- Distributed to scheduled visitors, clients, and contractors before visiting Arcadis offices or sites.
- Post the self-assessment questionnaire and post Appendix A at entrances and/or field trailers.

Minimize visitors on site. All visitors (staff, subcontractors, clients, anticipated guests, unanticipated guests) to the site must be asked to review the applicable questionnaire from the following list.

Canada COVID-19 Health Screening Self-Assessment Questionnaire for Staff (English)

Canada COVID-19 Health Screening Self-Assessment Questionnaire for Staff (French)

Canada COVID-19 Health Screening Self-Assessment Questionnaire for Visitors (English)

Canada COVID-19 Health Screening Self-Assessment Questionnaire for Visitors (French)

U.S. COVID-19 Health Screening Self-Assessment Questionnaire for Staff, Contractors and Scheduled Visitors (English)

U.S. COVID-19 Health Screening Self-Assessment Questionnaire for Staff, Contractors and Scheduled Visitors (Spanish)

U.S. COVID-19 Health Screening Self-Assessment Questionnaire for Unscheduled Visitors/Guests (English)

U.S. COVID-19 Health Screening Self-Assessment Questionnaire for Unscheduled Visitors/Guests (Spanish)

If a client has a similar questionnaire that Arcadis staff are required to complete, the client questionnaire may be substituted for Arcadis questionnaire.

2.2 Client COVID-19 Health Screening Forms

Some clients are requiring our employees to complete individual COVID-19 health screening forms.

These forms may include questions pertaining to your travel to certain countries, your contact with people diagnosed with COVID-19, and whether you have experienced flu-like symptoms in the last 14 days.

- You are not required to share personal medical information with clients; therefore, Arcadis is not requiring you to complete any form requesting medical information. Your disclosure of personal medical information to clients is completely voluntary.
- Please understand, if you do not complete the form, you will not be allowed on the client's sites and facilities, per the client's directive.
- Also, if you complete the form, you have an ongoing duty to provide prompt notice of any changes to any of your responses. (Some clients may require periodically signing updated forms).
- If you are restricted from a client site as a result of your answers to the COVID-19 health screening form, or because you have chosen not to complete the form, Arcadis will attempt to find you alternative work that does not involve access to the client's site or facility; although, Arcadis cannot guarantee that other work will be available.

If your Project Manager is not already aware of the client COVID-19 health screening form, please alert them when you receive one from a client.

2.3 Practice Good Hygiene

The best way to prevent illness is to avoid exposure to the virus. CDC and Health Canada recommend common flu and cold season preventative measures, including:

- Get a flu vaccine.
- Wash hands often with soap and water for at least 20 seconds. If soap and water are not readily available, use a hand sanitizer with at least 60% alcohol.
    - If hand sanitizer or soap & water are not available on site, bring your own source of water and hand soap to accommodate hand washing.
- Avoid touching your eyes, nose and mouth.
- Cover your nose and mouth with a tissue when sneezing or coughing.
- Do not share Personal Protective Equipment (PPE).
- Maintain and thoroughly clean PPE in accordance with manufacturer's instructions.
- Avoid sharing phones, offices, tools and equipment. If sharing is necessary, clean and disinfect prior to use.

2.3.1 Hand Hygiene

Hand hygiene for infection prevention is an important part of the U.S. and Canada response to COVID-19. Washing hands with soap and water has been and will continue to be our primary method for good hand hygiene. Both CDC and HC recommend that you wash hands often with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, or sneezing. Hand washing mechanically removes pathogens.

Alcohol based hand sanitizer is a flammable liquid and vapor. However, there is no evidence to suggest hand sanitizer poses a fire hazard when used according to package directions and warnings. To use hand sanitizer:

- Follow manufacturer instructions for use.
- Rub your hands together, covering all surfaces of both hands, including between your fingers and up around your fingertips and nails.
- Rub hands together for 30 seconds to allow your hands to completely absorb the product.
- Allow the hand sanitizer to completely dry.
- Do not touch food or anything until your hands are dry.
- Refer to the Safety Data Sheet (SDS) for hazards information.

If hand sanitizer is not available, Arcadis requires that project teams assess and address the need for hand washing (e.g., access to water and soap) while working on site. This can be achieved by having access to a functioning restroom, a portable hand washing station or as simple as having hand soap, bottled water and paper towels to clean hands as necessary. A handwashing sign that may be posted near handwashing stations is provided in Appendix E.

2.4 Clean Frequently Touched Surfaces

Arcadis recommends that project teams identify who is responsible for cleaning frequently touched surfaces in our workplaces (field trailers, client facilities, etc.). CDC and HC recommend that these surfaces are disinfected daily. This includes tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks. Before using a disinfectant product, understand the appropriate uses and limitations of the disinfectant, and refer to equipment/tool manufacturer care instructions to determine whether the disinfectant is compatible (e.g. using isopropyl alcohol to disinfect an iPhone).

> CDC cleaning and disinfecting facilities: https://www.cdc.gov/coronavirus/2019-ncov/prepare/disinfecting-building-facility.html
>
> Health Canada cleaning and disinfecting public spaces: https://www.canada.ca/en/public-health/services/publications/diseases-conditions/cleaning-disinfecting-public-spaces.html
>
> Health Canada hard surface disinfectants: https://www.canada.ca/en/health-canada/services/drugs-health-products/disinfectants/covid-19.html

If surfaces are dirty, clean them using detergent or soap and water prior to disinfection. To disinfect, most common EPA-registered or HC-approved household disinfectants will work. Use disinfectants appropriate for the surface.

In the current situation, the sourcing of disinfectant products is limited and as the supply of these individually packaged products are depleted, CDC and HC have outlined an option to use a diluted household bleach solution (at least 1,000 ppm sodium hypochlorite) as a disinfectant.

Standard household bleach is typically 5.25% sodium hypochlorite (52,500 ppm), whereas ultra-strength household bleach is typically 6% sodium hypochlorite (60,000 ppm). In accordance with Hazard Communication requirements, always refer to and have a copy of the Safety Data Sheet (SDS) available and on site with you. To **make a daily bleach solution** for use as a disinfectant:

- Mix 5 tablespoons (1/3rd cup) of standard bleach per gallon of water or for a smaller spray bottle size dilution, mix 4 teaspoons bleach per quart of water.

OR

- 1 teaspoon (5 mL) per cup (250 mL) OR 4 teaspoons (20 mL) per litre (1000mL).
  Note: Solution must be mixed daily, because the solution will lose effectiveness as a disinfectant after 24-hours.

Follow manufacturer's instructions (e.g., Clorox) for application and proper ventilation, ensuring a contact time of at least 1 minute (for specific products and contact time information, refer to the CDC and HC links above). Check to ensure the product is not past its expiration date. Never mix household bleach with ammonia or any other cleanser. According to the HC, CDC and U.S. EPA, unexpired household bleach will be effective against coronaviruses when properly diluted.

A second alternative is to use an alcohol solution. The solution must have at least 70% isopropanol.

If supplies cannot be sourced locally, complete the PPE Request Form and submit to PPErequests@arcadis.com.

2.5 Practice Social Distancing

The CDC definition of **social distancing**, also called "physical distancing," means keeping a safe space (approximately 6 feet or 2 metres) between yourself and other people who are not from your household in both indoor and outdoor spaces. Situations where social distancing should be practiced are tailgate and safety briefing meetings, breaks in field trailers, entering stores and workstations. Plan and re-plan work activities to maximize social distancing and minimize close contact with others. If there are instances where social distancing is not being practiced, Stop Work and remove yourself from the situation. Contact the Project Manager or your Supervisor and document in the H&S App as an "Close Call" or "Unsafe Behavior."

Additional information when working in teams is required is discussed in the "work specific situations" section below.

> **Note:** The CDC defines **close contact** as: as a person who was within 6 feet of an infected person for a cumulative total of 15 minutes or more over a 24-hour period starting from 2 days before illness onset (or, for asymptomatic patients, 2 days prior to test specimen collection) until the time the patient is isolated.[1]

2.6 Personal Protective Equipment

Be prudent with PPE use (PPE with a purpose). The supply of certain PPE items is limited. Continue to work with our vendors on your PPE ordering needs and consider alternatives (e.g. N95 dust masks may

[1] Individual exposures added together over a 24-hour period (e.g., three 5-minute exposures for a total of 15 minutes). Data are limited, making it difficult to precisely define "close contact;" however, 15 cumulative minutes of exposure at a distance of 6 feet or less can be used as an operational definition for contact investigation. Factors to consider when defining close contact include proximity (closer distance likely increases exposure risk), the duration of exposure (longer exposure time likely increases exposure risk), whether the infected individual has symptoms (the period around onset of symptoms is associated with the highest levels of viral shedding), if the infected person was likely to generate respiratory aerosols (e.g., was coughing, singing, shouting), and other environmental factors (crowding, adequacy of ventilation, whether exposure was indoors or outdoors). Because the general public has not received training on proper selection and use of respiratory PPE, such as an N95, the determination of close contact should generally be made irrespective of whether the contact was wearing respiratory PPE. At this time, differential determination of close contact for those using fabric face coverings is not recommended.

not be available, but half face elastomeric respirators with P100 cartridges are available in limited supplies). If PPE and supplies cannot be sourced locally, complete the PPE Request Form and submit to PPErequests@arcadis.com.

Some jurisdictions are requiring gloves be worn while completing essential activities. Select the appropriate glove for the task and include in the HASP, JSA and/or COVID-19 Preparedness, Response and Continuity Plan.

Before using nitrile gloves as personal protective equipment (PPE), make sure to:

- Wash and dry your hands before and immediately after using gloves
- Understand how to put nitrile gloves on and take them off (refer to The Orange Line article)
- Nitrile gloves offer protection against common consumer cleaning supplies, chlorinated solvents, and offer good dexterity and sensitivity
- Change gloves between tasks or wash gloved hands with soap and water between tasks
- Do not touch your face
- Inspect gloves frequently for rips, tears, etc. and replace as necessary
- Understand limitations of nitrile gloves

2.7 Reporting a COVID-19 Exposure

If you have tested positive for COVID-19 or have been asked to be tested for COVID-19 by a medical professional, please notify Brian Kundert. Your identity will remain confidential.

If you learn you have been in **close contact** with a worker, client or member of the public who is COVID-19 positive:

- Stop work.
- Notify your Supervisor and Project Manager.
- Self-quarantine and contact your personal physician for additional direction.
    - If work is being completed under the critical infrastructure guidance and you are not experiencing symptoms consistent with COVID-19 following close contact with a COVID-19 positive individual, refer to the “Yellow Caution Status Guidance” flow chart (Canada and U.S.) to determine whether you may continue to work.
- If you’ve been tested or asked to be tested for COVID-19 by a medical professional, please notify Brian Kundert. Your identity will remain confidential.

2.8 Interim Guidelines for Cardiopulmonary Resuscitation

The American Heart Association and Hearth & Stroke Foundation of Canada have issued interim Hands-only cardiopulmonary resuscitation (CPR) guidelines to reduce the risk when helping victims of cardiac arrest with suspected or confirmed COVID-19.

CPR and the use of automated external defibrillators (AED) significantly improve the chance of survival of patients experiencing cardiac arrest. During the COVID-19 pandemic, first aid trained folks and bystanders may feel uncomfortable performing lifesaving CPR and increasing their own risk of contracting the virus.

Hands-only CPR involves performing chest compressions only at a rate of 100 to 120 compressions per minute until an ambulance arrives.

When administering CPR, consider:

- Wearing a face covering
- Laying a cloth, towel, or clothing over the person's mouth and nose
- Perform hands-only CPR
- Use an AED, if available

2.9 Other Considerations

When planning field work, consider the following:

- Plan your journey to and from the site to manage social distancing and hand hygiene when you need to stop for gas or at a store for supplies
- Reevaluate the current field work situation as it relates to lone worker protocols
- Verify travel routes to the local emergency room have not changed, and as a best practice, verify whether the selected hospital has screening policy before entering due to the COVID-19 situation
- A COVID-19 Preparation, Response and Continuity Plan template is available for use when a client requires a COVID-19 project Continuity Plan

3 TRAVEL GUIDANCE

3.1 Traveling Between States, Provinces or Territories

Some states, provinces and territories have issued executive orders requiring self-quarantine, travel health screening questionnaires and/or COVID-19 testing for people traveling into or from certain locations. While some jurisdictions exempt essential workers, self-quarantine requirements may apply during off-work hours, confining the employee to their lodging location. Check local requirements before you travel to determine whether you can travel or if there is a need to self-quarantine at the destination. Project teams should consider using local staff to complete project work.

Refer to the "Orders – Essential Functions, Travel Restrictions and Office Planning" for current jurisdictional self-quarantine orders.

3.2 Field Vehicles and Transportation

When using shared vehicles (fleet, rental, ride sharing services) follow the cleaning guidance above for frequently touched surfaces. Check with your rental agency before vehicle pick-up to understand their cleaning procedures, and supplement with your own cleaning, as necessary. Note: if using wipes, make sure the wipe is compatible with the surface being cleaned.

It is best practice for individuals to be assigned their own vehicle, when possible. If traveling with multiple people in the same vehicle is necessary:

- Maintain as much space between occupants, as practical, in the vehicle. If only two occupants, consider having one occupant in the back seat if vehicle is equipped with a back seat.
- Limit number of people in the vehicle to 4.
- Consider using the fresh air setting when operating the air conditioning or heater.
- Do not share a vehicle with other occupants if you believe you are at risk of spreading COVID-19.

- Consider wearing a face covering (the face covering should not limit visibility).

When traveling by air for business critical travel, check with the airline to obtain their latest COVID-19 requirements. A summary of current airline COVID-19 policies can be found in the “Airline COVID-19 Policy Summary” file located on the COVID-19 FAQ page. Additional safety information on airlines, airport security and rail is available from World Travel.

3.3 Lodging Considerations

Most hotel chains have implemented additional cleaning, disinfection and face covering in common area procedures. Check with your hotel before check-in to understand their procedures. Consider bringing a surface cleaner or disinfecting wipes to clean frequently touched surfaces such as doorknobs, tv remote, etc.

On long term assignments, discuss with Project Manager whether it is feasible to not check out of a hotel room over the weekend or brief project breaks.

In instances where AirBnB has been authorized and approved in writing by the Project Manager and Supervisor, consider the following:

- The entire team should not stay at the same residential facility.
- Understand the AirBnB may need additional cleaning and disinfection of commonly touched surfaces upon arrival.

Always maintain good personal hygiene and avoid crowded places such as restaurants or bars. Consider using take out or outdoor seating. If self-quarantine is required by the jurisdiction during off-work hours, plan ahead and evaluate local food and/or grocery delivery options.

3.4 Rental Equipment and Sample Cooler Handling

Clean the exterior of rental equipment and sample coolers upon arrival at the job site using a cleaning product that will not impact data quality. Wear gloves and safety glasses when handling sample coolers to prevent contact with acid preservation of the bottles in coolers. Where possible, order separate sets of equipment and “assign” equipment to individuals for use through the duration of the event.

4 WORK-SPECIFIC SITUATIONS

4.1 Working with Little or No Contact with Others

Follow procedures listed in Section 2.0 and Section 3.0.

4.2 Working in Project Teams

When working in project teams (paired Arcadians, embedded staff, contractors, clients, etc.):

- If feasible, prior to visiting the site, have a H&S check in to confirm all attendees are complying with CDC or Health Canada guidelines, including:
    - Confirm understanding that workers or clients should not go to the job site if they have personally tested positive for COVID-19, have been in close contact to anyone else who has tested positive for COVID-19 or are exhibiting symptoms. If a worker discloses close

contact with someone COVID-19 positive and the worker is asymptomatic, contact the Project Manager and review the "COVID-19 Flow Chart - H&S App Yellow Caution Status Guidance" located on the H&S "Forms and Templates" Intranet page.

- Out of respect for all, ask everyone to self-disclose if they are not feeling well (exhibiting flu-like symptoms), and request that they should go home.
- Observe person(s) for symptoms, and use Stop Work, as necessary, and contact Project Manager.
- Set visual or physical barriers to keep the public away (caution tape and cones).
- Consider if "split shifts" can be used to limit contact, or if work can be scheduled during hours of low to no facility operations.

- Arcadis staff plan work activities, continuously use TRACK and re-plan work activities to maximize social distancing and minimize "close contact"
    - Practice good hygiene and clean commonly touched surfaces
        - Clean clipboard and pen prior to use
        - Bring your own pen
        - Disinfect shared equipment (water level meters, pumps, etc.)
        - Coordinate with sanitation vendor for portable hand wash station (soap & water or hand sanitizer)
    - Use work practices and tools to minimize close contact when feasible, such as:
        - Single person operating a winch instead of a two-person manual lift
        - Tools to maximize distance
    - Use PPE in accordance with the Job Safety Analysis (face shield, safety glasses, gloves, etc.)
    - Plan for breaks to allow for hydration, nutrition and rest/prevention of heat related illness
        - Select locations where social distancing can be maintained
        - Allow time for safe doffing/donning of personal safety items
        - Communicate individual needs for breaks before beginning work.
- If social distancing or other controls are not feasible discuss this with your supervisor and PM, discuss "Is the work necessary?" or "Can the work be rescheduled for a later date?"
    - Refer to Section 2.5 for the definition of close contact. CDC has indicated short periods of time in close contact may not increase risk of exposure.
- Subcontractors need to develop and implement their own procedures to protect their workers.

4.3 Embedded Employee Working at a Client Facility

Embedded employee at a client facility should:

- Inquire whether working remotely is an option.
- If not, and Arcadis must work at the client facility:
    - Ask if arrangements can be made to practice social distancing (e.g. split shift, separate workstation, etc.)
    - Practice good hygiene, and if you do not feel the situation is safe, you can execute your stop work authority by having discussions with your Supervisor and Project Manager.
- If client facility cleanliness is a concern discuss concerns with Project Manager. The Project Manager will discuss with the client. If the client will not increase cleaning, Arcadis employees will be provided with the supplies to clean and disinfect frequently touched surfaces as well as supplies to clean hands.
- Discuss and document Arcadis, client and jurisdictional protocol for reporting a COVID-19 case using the template in the Arcadis COVID-19 Preparedness, Response and Continuity Plan or similar form.

4.4 Working in Contact with the Public

When working in contact with the public (mall areas, parks, outdoor residential settings):

- Set visual or physical barriers (caution tape and cones) to keep the public away and maintain social distancing.
- Consider posting signs reminding the public of CDC social distancing guidance (example in Appendix B).
    - Example sign may say:

CDC / Health Canada Guidelines

Practice Social Distancing

No groups larger than 10

Maintain 6 feet (2 metres) distance to others

4.5 Working at Indoor Residential Settings

When working at indoor residential settings, please consider whether the work can be rescheduled for a later date, and if not, then consider the following guidelines:

- Call ahead to ask if the resident(s) is experiencing flu-like symptoms or if anyone in the house is in mandatory or precautionary self-quarantine. Also share Arcadis work procedures and explain that Arcadis will be practicing social distancing during the work.
- Upon arrival, assess the residents for signs of flu-like symptoms. If observed, use Stop Work, exercise social distancing and contact the Project Manager.
- Where feasible, wear gloves, wipe down surfaces prior to touching them and thoroughly wash hands after completing the work (do not touch face).
- Ask if arrangements can be made to practice social distancing (meaning stay 6 feet [2 metres] away).
- Schedule your work when resident is not home, if your work area allows for access (e.g. a basement crawl space the doesn't require entry to the main living area of the home).

4.6 Projects Involving Drinking Water Systems, Recreational Water and/or Wastewater

According to the CDC, at this time, the risk of transmission of the virus that causes COVID-19 through sewerage systems is thought to be low. Although transmission of the virus that causes COVID-19 through sewage may be possible, there is no evidence to date that this has occurred.

Wastewater and sewage workers should use standard practices, practice basic hygiene precautions, and wear personal protective equipment (PPE) as prescribed for current work tasks.

When working on projects involving drinking water systems, recreational water and/or wastewater:

- The COVID-19 virus has not been detected in drinking water.
- Conventional water treatment methods that use filtration and disinfection, such as those in most municipal drinking water systems, should remove or inactivate the virus that causes COVID-19.
- At this time, the risk of transmission of the virus that causes COVID-19 through sewage systems is thought to be low.

- Review the project Health & Safety Plan and task-specific Job Safety Analysis for required personal protective equipment and other controls.

4.7 Construction Management/Construction

4.7.1 Field Trailers

Field trailers may present unique challenges for social distancing. Consider the following:

- Designate “enter only” and “exit only” for trailers with more than one door.
- Restrict access by posting site signage (Appendix E) requesting all visitors, including site workers, to not enter and instead utilize telephone or radio for communication.
    - The project team will determine the maximum occupancy based on the ability to maintain social distancing.
- Prior to entering a trailer, assess the current occupancy.
- Maintain a log of visitors entering the trailer use the “Arcadis Contact Tracing Log” in Appendix F. Assign a person responsible for signing visitors in and out.
- Clean surfaces regularly. In the absence of professional cleaning services, occupants will develop a schedule for site personnel to complete cleaning of commonly touched surfaces.
    - When using common surfaces, each individual is responsible for wiping down the shared surface before and after use.
- Assess and address the need for the availability of hand washing (e.g., access to water and soap) while working on site. This can be achieved by:
    - Having access to a functioning restroom
    - Portable hand washing station
    - Hand soap and bottled water to clean hands as necessary.
- Plan seating arrangement so that personnel inside the trailer maintain social distancing, at least 6-feet (2 m) of separation.
- Consider the use of physical barriers to separate the field trailer from the public and/or site activities.

4.7.2 Other Construction Guidance

Additional guidance related to construction and construction management activities include:

- Consider use of technology (e.g., digital sign in using QR codes, virtual tailgate or construction meetings, video camera systems to minimize the number of people on site).
- For tailgate or other meetings that are not virtual, consider:
    - Have the person leading the meeting sign everyone in.
    - If signature is required, everyone should have their own pen.
    - Maintain social distancing with at least 6-feet (2 m) of separation.
    - Hold meetings in outdoor spaces.
- Simultaneous operations coordination to separate contractors:
    - Coordinate movements around the site

    - Set up work zones with visual barriers for specific activities with transition areas in common spaces
    - Post social distancing signage (refer to Section 4.4)
    - Maintain social distancing with at least 6-feet (2 m) of separation.
    - Consider the following administrative controls:
        - Activity rotation - schedule work when the fewest number of people are present
        - "Split shifts" can be used to limit contact, or if work can be scheduled during hours of low to no facility operations.
- Work in teams/pairs:
    - Plan work activities, continuously use TRACK and re-plan work activities to maximize social distancing and minimize "close contact"
    - Use equipment or tools to increase distance between personnel to greater than 6-feet (2m) or eliminate the need for a second person.
- Identify "choke points" and "high-risk areas" where workers may stand together (e.g., such as hallways, hoists and elevators, break areas, and buses) and use controls and signage to maintain social distancing. Examples may include:
    - Limiting the number of occupants in an elevator to two
    - One-way traffic pattern
    - Ground markings at 6-foot (2 m) intervals
- Coordinate with contractors to make sure they are following the same social distancing, hand hygiene and cleaning guidance to reduce the risk to other project personnel.
- Jurisdiction-mandated social distancing protocol may be required. An example is included in Appendix C.

4.8 Cloth Face Coverings

Health Canada and CDC recommends wearing cloth face coverings in public settings when around people outside of their household, especially when other social distancing measures are difficult to maintain (e.g., grocery stores, pharmacies, big box stores, shipping locations, mass transportation, events and gatherings). Wearing cloth face coverings is an additional public health measure people should take to reduce the spread of COVID-19. Health Canada and CDC still recommends that you stay at least 6 feet away from other people (social distancing), frequent hand cleaning, avoid contact with people who are sick and other everyday preventive actions. A cloth face covering is not intended to protect the wearer, but it may prevent the spread of virus from the wearer to others. This would be especially important if someone is infected but does not have symptoms. Face coverings with exhalation valves or vents should NOT be worn to help prevent the person wearing the mask from spreading COVID-19 to others.

Face coverings offering various features appropriate for different work environments, including moisture wicking and FR, are now in stock at Airgas (U.S.). The Face Covering Guide outlines several options to facilitate selection of the face covering that is appropriate for your work. Cloth face coverings may also be fashioned from household items or made at home from common materials at low cost can be used as an additional, voluntary public health measure.

The cloth face coverings recommended are not surgical masks or N-95 respirators. Those are critical supplies that must continue to be reserved for healthcare workers and other medical first responders, as recommended by current Health Canada and CDC guidance.

Some jurisdictional entities and clients require the use of cloth face coverings based on Health Canada and CDC guidance. CDC guidance on selection, use and care of face coverings is included in Appendix D.

4.9 KN95

During periods of shortages of N95 FFRs, the federal government advises that FFRs, air-purifying elastomeric respirators, and compatible filters certified under other countries or jurisdictions (e.g., KN95 made in China) will provide greater protection than surgical masks (i.e., facemasks, other than surgical N95s), homemade masks, or improvised mouth and nose covers, such as bandanas and scarves. Certification in accordance with country or jurisdiction standards ensures that devices provide similar filtration as NIOSH-certified equipment and have an assigned protection factor greater than or equal to 10.

If the KN95 is not required PPE as part of a regulatory requirement, the KN95 can be used voluntarily. Voluntary users must review Appendix D of 1910.134. If the KN95 is required PPE as part of a regulatory requirement, the Arcadis country-specific Respiratory Protection H&S Standard applies.

5 POST SHIFT CONSIDERATIONS

At the end of the work shift, clean the vehicle, if used throughout the day. Wash hands prior to leaving the site and after the commute.

Upon arriving home or at lodging, shower and launder clothing.

APPENDIX A

Site Signage – Self-Assessment Required

ARCADIS

Arcadis Employees

Have you done your self-assessment today?

Before each day, you must complete the online **self-assessment**.

QR Code for daily self-assessment.

SAFE Return

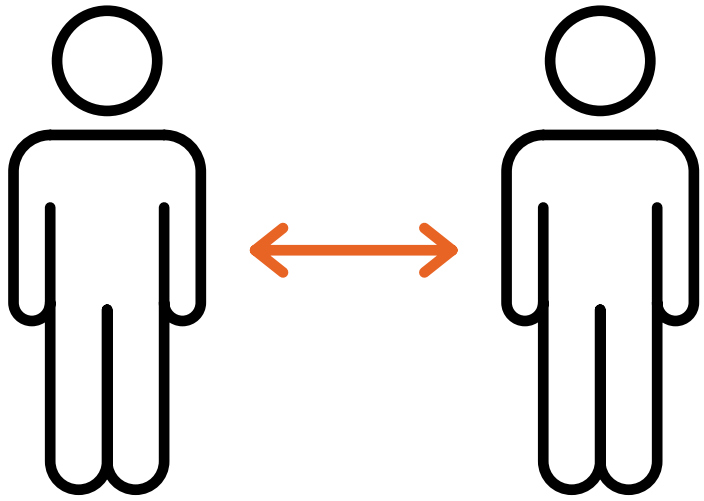
APPENDIX B

Site Signage – Social Distancing

ARCADIS

Best Practices

Social distance



Remember to stand a minimum of 6 feet apart from others while occupying a common space.

SAFE Return

APPENDIX C

Jurisdiction-mandated Social Distancing Protocol Example

Jurisdiction-Mandated Social Distancing Protocol

Arcadis employees and visitors will adhere to social distancing guidelines. This Social Distancing Protocol is a supplement to meet the requirements of specific jurisdictions requiring a written plan.

The following signs will be posted at the entrance to each active office and project site:

- Stop: Complete the Arcadis COVID-19 Health Screening Self-Assessment Questionnaire
- Stop: Social Distancing
- Novel Coronavirus Prevention Measures
- Arcadis COVID-19 Health Screening Self-Assessment Questionnaire for unscheduled visitors and guests (English and Spanish)
- This protocol once completed by the office or project site.

Protecting Employee Health

Arcadis has directed all employees who can complete their work duties from home to not come into the office. Through Location Leader communications and the COVID-19 Guidance for Field and Embedded Staff, Arcadis has reinforced social distancing by maintaining separation of at least 6 feet (2 metres).

All employees have been instructed to not come to work if they do not feel well. Prior to leaving for an office or project site, Arcadis employees and scheduled visitors are requested to complete the COVID-19 Health Screening Self-Assessment Questionnaire (English and Spanish). Arcadis staff may use the H&S App to complete their daily (or multiple times a day, if appropriate) COVID-19 Health Screening Self-Assessment. Unscheduled visitors will be asked to complete the self-assessment prior to entering the office or project site (English and Spanish).

Face coverings will be worn, as appropriate. Refer to Appendix D of the COVID-19 Guidance for Field and Embedded Staff.

Facility Information

(Complete the questions listed below then delete this comment)

Cleaning and disinfection of frequently touched surfaces will be completed at Arcadis office and project locations.

Office/Project Location Address:

Cleaning is the responsibility of:

Cleaning is being completed on the following schedule:

Restrooms:
Breakrooms:
Other:

Cleaning and disinfectant related supplies are located:

Hand washing stations with soap and water are located:

Hand sanitizer stations are located: *If this does not apply, say "NA, see hand washing station"*

Copies of this protocol will be posted and distributed to office or project site Arcadis employees.

You may contact the following person with any questions or comments about this protocol.

Name: Phone #: Email:

APPENDIX D

Interim Guidance for the Use of Face Coverings

Interim Guidance for the Use of Face Coverings

Health Canada and CDC recommends wearing cloth face coverings in public settings when around people outside of their household, especially when other social distancing measures are difficult to maintain (e.g., grocery stores, pharmacies, big box stores, shipping locations, mass transportation, events and gatherings). Wearing cloth face coverings is an additional public health measure people should take to reduce the spread of COVID-19. Health Canada and CDC still recommends that you stay at least 6 feet away from other people (social distancing), frequent hand cleaning, avoid contact with people who are sick and other everyday preventive actions.

According to the CDC, recent studies show that a significant portion of individuals with COVID-19 lack symptoms (“asymptomatic”) and that even those who eventually develop symptoms (“pre-symptomatic”) can transmit the virus to others before showing symptoms. This means that the virus can spread between people interacting in close proximity - for example, speaking, coughing, or sneezing—even if those people are not exhibiting symptoms. Face coverings may help prevent people who have COVID-19 from spreading the virus to others and are recommended as a simple barrier to help prevent respiratory droplets from traveling into the air and onto other people.

Considerations for cloth face coverings:

- Some jurisdictional entities and clients are now requiring the use of cloth face coverings based on Health Canada and CDC guidance.
- A cloth face covering is not intended to protect the wearer, but it may prevent the spread of virus from the wearer to others. This would be especially important if someone is infected but does not have symptoms.
- The cloth face coverings recommended are not surgical masks or N-95 respirators.
- These do not replace other evidence-based measures such as social distancing, frequent hand washing practices, and remaining at home when not doing essential activities.
- People should also be aware that face coverings can become contaminated on the outside or when touched by unwashed hands.
- Avoid moving the face covering around or adjusting it often.
- Face coverings should not be shared with others.
- Face coverings with exhalation valves or vents should NOT be worn to help prevent the person wearing the mask from spreading COVID-19 to others (source control).

What is a Cloth Face Covering?

A cloth face covering is a material that covers the nose and mouth. It can be secured to the head with ties or straps or simply wrapped around the lower face. This can be made from a variety of materials, such as cotton, silk, linen or non-woven fabrics. A cloth face covering may be disposable; factory-made; homemade or hand-sewn; or can be improvised from household items such as bandana, scarfs, T-shirts, sweatshirts, or towels.

Face Covering Use & Care

Wash hands prior to touching your cloth face covering (i.e. putting it on, adjusting, removing). The cloth face covering should cover the nose, mouth and secure under the chin. It should fit snugly against the sides of the face. When removing the mask, avoid touching the front of the mask and your face with your hands. Upon removing a face covering, you also need to wash your hands.

Disposable face coverings will be discarded after each use.

Reusable cloth face coverings must be washed daily after use. The face covering will be placed in a sealed bag or bin until it can be laundered.

Cleaning cloth face coverings using a washing machine:

- Face coverings can be washed with regular laundry
- Use regular laundry detergent and the warmest appropriate water setting for the cloth used to make the face covering.

Washing cloth face coverings by hand:

- Prepare a bleach solution by mixing:
    - 5 tablespoons (1/3rd cup) household bleach per gallon of room temperature water or
    - 4 teaspoons household bleach per quart of room temperature water
- Check the label to see if your bleach is intended for disinfection. Some bleach products, such as those designed for safe use on colored clothing, may not be suitable for disinfection. Ensure the bleach product is not past its expiration date. Never mix household bleach with ammonia or any other cleanser.
- Soak the face covering in the bleach solution for 5 minutes.
- Rinse thoroughly with cool or room temperature water.
- Before wearing, make sure the cloth face covering is completely dry after washing.

Dry face coverings by:

- Machine using the highest heat setting and leave in the dryer until completely dry
- Air dry by laying flat and allow to completely dry. If possible, place the cloth face covering in direct sunlight.

Discard cloth face coverings that:

- No longer cover the nose and mouth
- Have stretched out or damaged ties or straps
- Will not stay on the face
- Have holes or tears in the fabric

APPENDIX E

Additional Signage

ARCADIS

Best Practices

Wash your hands.

Wash in hot water for 40 seconds: 20 seconds with soap, 20 seconds to rinse.

Wipe surfaces with disinfectant wipes after you are finished.

Maintain proper social distancing.

Stand back 6 feet from others who may be washing their hands, or waiting in line to wash.

SAFE Return

ARCADIS

Best Practices

You touch it, you clean it.



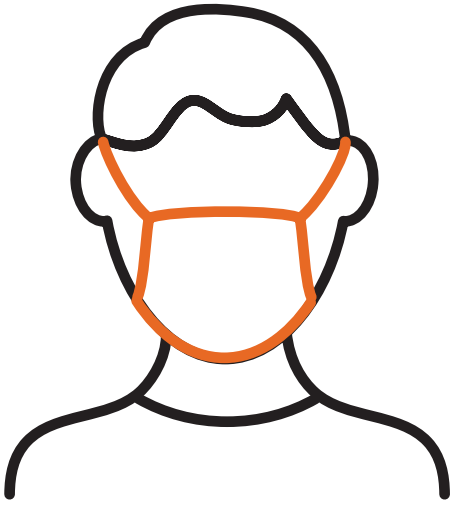
Remember to clean any surface you touch with the provided disinfectant spray.

SAFE Return

ARCADIS

Arcadis Staff, Visitors & Deliveries

Wear face cover.



Please wear face covering when moving about the space. Face coverings can be removed while seated at workstation.

SAFE Return

ARCADIS

Visitors & Deliveries

In order to maintain proper social distancing, we are not admitting visitors at this time.

If you have an appointment with a staff member, please contact them directly.

If this is a delivery, please leave the package here or contact the office manager to gain access. **Face covering is required!**

Firstname Lastname (### ### #####)

SAFE Return

ARCADIS

Visitors & Deliveries

All staff, visitors or deliveries must use the main entrance.

Located: (Third floor, main reception desk)

Firstname Lastname (### ### ####)

SAFE Return

ARCADIS

Restricted

Limited Use

In order to maintain proper social distancing, this area is open for hand washing only. Do not use microwaves, refrigerators, coffee makers or any other equipment.

SAFE Return

ARCADIS

Restricted

Authorized Staff Only

In order to maintain proper social distancing, this area is restricted to authorized staff.

Need something?

Contact: Firstname Lastname (### ### ####)

SAFE Return

ARCADIS

Restricted

Maximum Occupancy

##

In order to maintain proper social distancing, the number of people allowed in this area is limited.

SAFE Return

ARCADIS

Closure

Room Closed

In order to maintain proper social distancing guidelines, this room is temporarily closed.

SAFE Return

Off limits

CUT

Do not use

CUT

Restricted

ARCADIS

Arcadis Employees

Have you done your mid-day self- assessment?

During your visit each day, you must complete the additional mid-day online **self-assessment**.

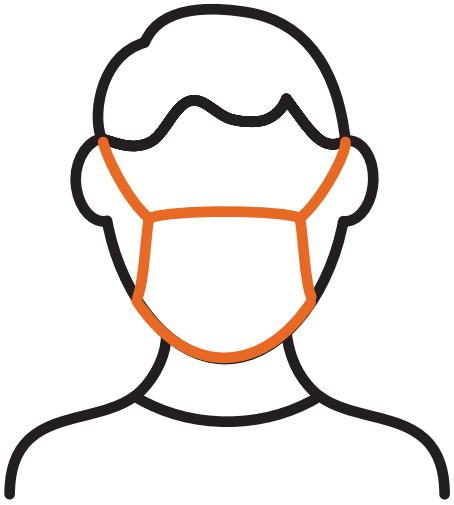
QR Code for daily self-assessment.

SAFE Return

ARCADIS

Arcadis Staff, Visitors & Deliveries

Wear face cover.



Face covering must be worn at
all times.

SAFE Return

APPENDIX F

Arcadis Contact Tracing Log

ARCADIS Design & Consultancy for natural and built assets

Arcadis Contact Tracing Log

Printed Name	Company	Cell phone or email	Date/Time On Site	Date/Time Off Site

ATTACHMENT 2

Jurisdictional Requirements

Reopening New York



Construction Guidelines for Employers and Employees

These guidelines apply to all construction businesses in regions of New York that have been permitted to re-open, as well as to construction businesses statewide that were previously permitted to operate as essential.

During the COVID-19 public health emergency, all construction businesses should stay up to date with any changes to state and federal requirements related to construction activities and incorporate those changes into their operations. This guidance is not intended to replace any existing applicable local, state, and federal laws, regulations, and standards.

	Mandatory		Recommended Best Practices	
Physical Distancing	✓	Ensure 6 ft. distance between personnel, unless safety or core function of the work activity requires a shorter distance.	✓	Create additional space for employees by limiting in-person presence to only personnel necessary for the current task(s), adjusting workplace hours, staggering arrival/departure times, creating A/B teams, and/or scheduling only one team in an area at a time.
	✓	Any time personnel are less than 6 ft. apart from one another, personnel must wear acceptable face coverings.	✓	Modify alignment of workstations to maintain 6 ft. distance and avoid multiple crews and/or teams working in one area. If not feasible, provide and require face coverings or enact physical barriers (e.g. plastic shielding walls), in accordance with OSHA guidelines, in areas where they would not impair air flow, heating, cooling, or ventilation.
	✓	For any work occurring indoors, limit workforce presence to no more than 1 worker per 250 sq. ft. on site, excluding supervisors in this calculation, unless additional personal protective measures are implemented (e.g. face coverings at all times).	✓	Reduce bi-directional foot traffic by posting signs with arrows in narrow aisles, hallways, or spaces.
	✓	Tightly confined spaces (e.g. elevators, hoists) should be occupied by only one individual at a time, unless all occupants are wearing face coverings. If occupied by more than one person, keep occupancy under 50% of maximum capacity.	✓	Have employees work from home whenever possible.
	✓	Post social distancing markers using tape or signs that denote 6 ft. of spacing in commonly used and other applicable areas on the site (e.g. clock in/out stations, health screening stations).	✓	Prohibit non-essential visitors on the site.
	✓	Limit in-person gatherings as much as possible and use tele- or video-conferencing whenever possible. Essential in-person gatherings (e.g. meetings) should be held in open, well-ventilated spaces with appropriate social distancing among participants.		
	✓	Establish designated areas for pick-ups and deliveries, limiting contact to the extent possible.		
Protective Equipment	✓	Employers must provide employees with an acceptable face covering at no-cost to the employee and have an adequate supply of coverings in case of replacement.		

Reopening New York



Construction Guidelines for Employers and Employees

These guidelines apply to all construction businesses in regions of New York that have been permitted to re-open, as well as to construction businesses statewide that were previously permitted to operate as essential.

During the COVID-19 public health emergency, all construction businesses should stay up to date with any changes to state and federal requirements related to construction activities and incorporate those changes into their operations. This guidance is not intended to replace any existing applicable local, state, and federal laws, regulations, and standards.

	Mandatory		Recommended Best Practices	
Protective Equipment (cont'd)	✓	Acceptable face coverings include but are not limited to cloth (e.g. homemade sewn, quick cut, bandana) and surgical masks, unless the nature of the work requires stricter PPE (e.g. N95 respirator, face shield).		
	✓	Face coverings must be cleaned or replaced after use or when damaged or soiled, may not be shared, and should be properly stored or discarded.		
	✓	Limit the sharing of objects (e.g. tools, machinery, materials, vehicles) and discourage touching of shared surfaces; or, when in contact with shared objects or frequently touched areas, wear gloves (trade-appropriate or medical); or, sanitize or wash hands before and after contact.		
Cleaning and Hygiene	✓	Adhere to hygiene and sanitation requirements from the Centers for Disease Control and Prevention (CDC) and Department of Health (DOH) and maintain cleaning logs on site that document date, time, and scope of cleaning.	✓	Wherever possible, increase ventilation of outdoor air (e.g. opening windows and doors) while maintaining safety precautions.
	✓	Provide and maintain hand hygiene stations for personnel, including handwashing with soap, water, and paper towels, as well as an alcohol-based hand sanitizer containing 60% or more alcohol for areas where handwashing is not feasible.	✓	Encourage employees to bring lunch from home and reserve adequate space for employees to observe social distancing while eating meals.
	✓	Provide and encourage employees to use cleaning/ disinfecting supplies before and after use of shared and frequently touched surfaces, followed by hand hygiene.		
	✓	Conduct regular cleaning and disinfection at least every day, and more frequent cleaning and disinfection of shared objects (e.g. tools) and surfaces, as well as high transit areas, such as restrooms and common areas.		
	✓	Cleaning and disinfecting of the site, shared surfaces, and other areas, as well as equipment and tools, should be performed using Department of Environmental Conservation (DEC) products identified by the Environmental Protection Agency (EPA) as effective against COVID-19.		

Reopening New York



Construction Guidelines for Employers and Employees

These guidelines apply to all construction businesses in regions of New York that have been permitted to re-open, as well as to construction businesses statewide that were previously permitted to operate as essential.

During the COVID-19 public health emergency, all construction businesses should stay up to date with any changes to state and federal requirements related to construction activities and incorporate those changes into their operations. This guidance is not intended to replace any existing applicable local, state, and federal laws, regulations, and standards.

	Mandatory		Recommended Best Practices	
Cleaning and Hygiene (cont'd)	✓	If cleaning or disinfection products or the act of cleaning and disinfecting causes safety hazards or degrades the material or machinery, personnel should have access to a hand hygiene station between use and/or be supplied with disposable gloves.		
	✓	Prohibit shared food and beverages (e.g. buffet-style meals).		
Communication	✓	Affirm you have reviewed and understand the state-issued industry guidelines, and that you will implement them.		
	✓	Post signage throughout the site to remind personnel to adhere to proper hygiene, social distancing rules, appropriate use of PPE, and cleaning and disinfecting protocols.		
	✓	Train all personnel on new protocols and frequently communicate safety guidelines.		
	✓	Establish a communication plan for employees, visitors, and clients with a consistent means to provide updated information.		
	✓	Maintain a continuous log of every person, including workers and visitors, who may have close contact with other individuals at the work site or area; excluding deliveries that are performed with appropriate PPE or through contactless means.		
	✓	If a worker tests positive for COVID-19, employer must immediately notify state and local health departments and cooperate with contact tracing efforts, including notification of potential contacts, such as workers or visitors who had close contact with the individual, while maintaining confidentiality required by state and federal law and regulations.		
	✓	Conspicuously post completed safety plans on site.		

Reopening New York



Construction Guidelines for Employers and Employees

These guidelines apply to all construction businesses in regions of New York that have been permitted to re-open, as well as to construction businesses statewide that were previously permitted to operate as essential.

During the COVID-19 public health emergency, all construction businesses should stay up to date with any changes to state and federal requirements related to construction activities and incorporate those changes into their operations. This guidance is not intended to replace any existing applicable local, state, and federal laws, regulations, and standards.

	Mandatory		Recommended Best Practices	
Screening	✓	Employees who are sick should stay home or return home, if they become ill at work.	✓	Perform screening remotely (e.g. by telephone or electronic survey), before reporting to the site, to the extent possible.
	✓	Implement mandatory health screening assessment (e.g. questionnaire, temperature check) before employees begin work each day and for essential visitors, asking about (1) COVID-19 symptoms in past 14 days, (2) positive COVID-19 test in past 14 days, and/or (3) close contact with confirmed or suspected COVID-19 case in past 14 days. Assessment responses must be reviewed every day and such review must be documented. Employees who present with COVID-19 symptoms should be sent home to contact their health care provider for medical assessment and COVID-19 testing. If tested positive, employee may only return completing a 14-day quarantine. Employees who present with no symptoms but have tested positive in past 14 days may only return to work after completing a 14-day quarantine. Employees who have had close contact with a confirmed or suspected person with COVID-19 but are not experiencing any symptoms should inform their employer and may be able to work with additional precautions, including regular monitoring for symptoms and temperature, required face covering all times, and appropriate social distancing from others.		
	✓	On-site screeners should be trained by employer-identified individuals familiar with CDC, DOH, and OSHA protocols and wear appropriate PPE, including at a minimum, a face covering.		
	✓	Have a plan for cleaning, disinfection, and contact tracing in the event of a positive case.		

ATTACHMENT 3

CDC Guidance on Disinfecting Surfaces

Cleaning And Disinfecting Your Facility

Everyday Steps, Steps When Someone is Sick, and Considerations for Employers

How to clean and disinfect



Wear disposable gloves to clean and disinfect.

Clean

- **Clean surfaces using soap and water.** Practice routine cleaning of frequently touched surfaces.

High touch surfaces include:



Tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, sinks, etc.

Disinfect

- Clean the area or item with soap and water or another detergent if it is dirty. Then, use a household disinfectant.
- **Recommend use of EPA-registered household disinfectant. Follow the instructions on the label** to ensure safe and effective use of the product.

Many products recommend:

- Keeping surface wet for a period of time (see product label).
- Precautions such as wearing gloves and making sure you have good ventilation during use of the product.

- **Diluted household bleach solutions may also be used** if appropriate for the surface. Check to ensure the product is not past its expiration date. Unexpired household bleach will be effective against coronaviruses when properly diluted.

  Follow manufacturer's instructions for application and proper ventilation. Never mix household bleach with ammonia or any other cleanser.

  Leave solution on the surface for **at least 1 minute**

  Bleach solutions will be **effective** for disinfection **up to 24 hours.**

  To make a bleach solution, mix:

  - 5 tablespoons (1/3rd cup) bleach per gallon of water

    OR

  - 4 teaspoons bleach per quart of water

- **Alcohol solutions with at least 70% alcohol.**



Soft surfaces

For soft surfaces such as **carpeted floor, rugs, and drapes**

- **Clean the surface using soap and water** or with cleaners appropriate for use on these surfaces.

cdc.gov/coronavirus

CS316270A 05/15/2020

- **Launder items** (if possible) according to the manufacturer's instructions. Use the warmest appropriate water setting and dry items completely.

OR

- **Disinfect with an EPA-registered household disinfectant.** These disinfectants meet EPA's criteria for use against COVID-19.

Electronics



- For electronics, such as **tablets, touch screens, keyboards, remote controls, and ATM machines**
- Consider putting a **wipeable** cover on electronics.
- **Follow manufacturer's instruction** for cleaning and dinfecting.
  - If no guidance, **use alcohol-based wipes or sprays containing at least 70% alcohol**. Dry surface thoroughly.

Laundry



For clothing, towels, linens and other items

- Launder items according to the manufacturer's instructions. Use the **warmest appropriate water setting** and dry items completely.
- **Wear disposable gloves** when handling dirty laundry from a person who is sick.
- Dirty laundry from a person who is sick **can be washed with other people's items**.
- **Do not shake** dirty laundry.
- Clean and **disinfect clothes hampers** according to guidance above for surfaces.
- **Remove gloves,** and wash hands right away.

Cleaning and disinfecting your building or facility if someone is sick



- **Close off areas** used by the person who is sick.
- **Open outside doors and windows** to increase air circulation in the area. **Wait 24 hours** before you clean or disinfect. If 24 hours is not feasible, wait as long as possible.



- Clean and disinfect **all areas used by the person who is sick**, such as offices, bathrooms, common areas, shared electronic equipment like tablets, touch screens, keyboards, remote controls, and ATM machines.
- If **more than 7 days** since the person who is sick visited or used the facility, additional cleaning and disinfection is not necessary.
  - Continue routing cleaning and disinfection.

When cleaning



- **Wear disposable gloves and gowns for all tasks in the cleaning process, including handling trash.**
  - Additional personal protective equipment (PPE) might be required based on the cleaning/disinfectant products being used and whether there is a risk of splash.
  - Gloves and gowns should be removed carefully to avoid contamination of the wearer and the surrounding area.
- **Wash your hands often** with soap and water for 20 seconds.
  - Always wash immediately after removing gloves and after contact with a person who is sick.

- Hand sanitizer: If soap and water are not available and hands are not visibly dirty, an alcohol-based hand sanitizer that contains at least 60% alcohol may be used. However, if hands are visibly dirty, always wash hands with soap and water.

- **Additional key times to wash hands** include:
  - After blowing one's nose, coughing, or sneezing.
  - After using the restroom.
  - Before eating or preparing food.
  - After contact with animals or pets.
  - Before and after providing routine care for another person who needs assistance (e.g., a child).

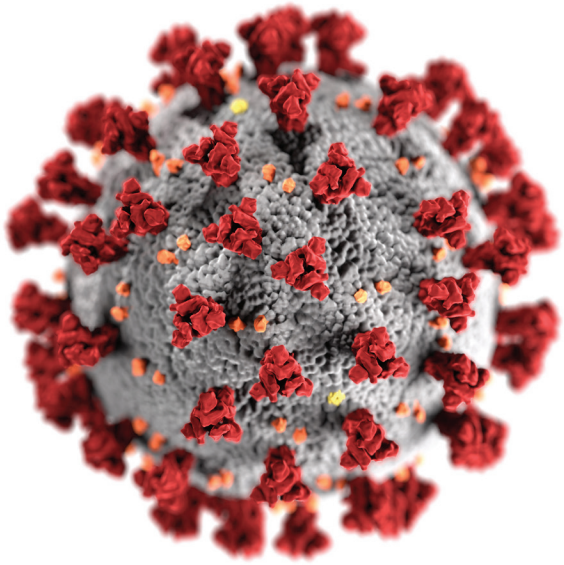
Additional Considerations for Employers



- **Educate workers** performing cleaning, laundry, and trash pick-up to recognize the symptoms of COVID-19.
- Provide instructions **on what to do if they develop symptoms within 14 days** after their last possible exposure to the virus.
- Develop **policies for worker protection and provide training** to all cleaning staff on site prior to providing cleaning tasks.
  - Training should include when to use PPE, what PPE is necessary, how to properly don (put on), use, and doff (take off) PPE, and how to properly dispose of PPE.
- Ensure workers are **trained on the hazards of the cleaning chemicals** used in the workplace in accordance with OSHA's Hazard Communication standard (29 CFR 1910.1200).
- **Comply** with OSHA's standards on Bloodborne Pathogens (29 CFR 1910.1030), including proper disposal of regulated waste, and PPE (29 CFR 1910.132).

For facilities that house people overnight:

- Follow CDC's guidance for colleges and universities. Work with state and local health officials to determine the best way to isolate people who are sick and if temporary housing is needed.
- For guidance on cleaning and disinfecting the bedroom/bathroom for someone who is sick, review CDC's guidance on disinfecting your home if someone is sick.



ATTACHMENT 4

COVID Health Screening Questionnaire – Arcadis Staff, Contractors & Anticipated Visitors

Arcadis COVID-19 Health Screening Self-Assessment Questionnaire

For Arcadis Staff, Contractors, Scheduled/Anticipated Visitors and Guests

Arcadis remains deeply focused on the health and well-being of our employees, clients, vendors, guests and the communities where we live and work. To help protect against the spread of the novel coronavirus SARS-CoV-2, which causes COVID-19, before visiting our offices, we ask all employees and guests to self-evaluate whether they pose an undue risk to the health and safety of others. To that end, we ask our employees and guests to review and consider the following:

1. In the past 14 days, have you been diagnosed (either as a presumptive or laboratory-confirmed diagnosis) with COVID-19?

2. Have you been advised by a doctor, healthcare provider, or any public health authority to stay home or otherwise avoid contact with others?

3. In the last 14 days have you had close contact within six (6) feet of an individual with confirmed COVID-19?[1]

4. In the last 48 hours have you had close contact within six (6) feet of an individual showing symptoms of COVID-19?[1]

5. Are you either experiencing or have you experienced coughing, shortness of breath, or other symptoms associated with COVID-19 during the last 24 hours?

6. Are you either experiencing or have you experienced a fever (defined as a temperature of 100.4°F/38°C or greater) within the last 24 hours? *Note: temperature should be measured without the use of fever-reducing medicines that contains ibuprofen or acetaminophen.*

7. In the past 14 days, have you traveled to any countries with Level 3 or higher Travel Health Notice as designated by the Centers for Disease Control? For information regarding Travel Health Notices, please see: https://www.cdc.gov/coronavirus/2019-ncov/travelers/after-travel-precautions.html

If your answer to any of these questions is yes, we respectfully ask that you do not visit our offices or worksites as scheduled. If you appear in our offices or worksites, we will assume that your answer to each of these questions was no. Thank you in advance for your attention and assistance with this matter.

[1] If answer is yes to questions 3 or 4 only AND you are a U.S. Critical Infrastructure/Essential worker, notify Supervisor and Project Manager and proceed to "H&S App Yellow Caution Status Guidance" flow chart.

ATTACHMENT 5

COVID-19 Flow Chart on Yellow Caution Status Guidance

H&S App Yellow Caution Status Guidance

Based on U.S. CDC Public Health Recommendations for Critical Infrastructure Workers

Yellow "Caution" message is received from the H&S App or directed here from the COVID-19 Health Screening Self-Assessment Questionnaire Flow Chart.

Does the "cautioned" employee need to report to the project site?

- no → Evaluate remote work options.
- yes

Will the client allow Arcadis to complete project site work in accordance with CDC's Critical Infrastructure Interim Guidance[1]? (Review client-specific COVID-19 protocols, or if unknown, answer NO.)

- yes →

Individuals should adhere to the following practices prior to and during their work:

- **Pre-Screen:** Complete the COVID-19 Health Screening Self Assessment and temperature check at least daily prior to arriving at work.
- **Regular Monitoring:** Self monitor and work may continue as long as the individual does not show signs of COVID-19 symptoms or fever. Stop Work if suspected COVID-19 symptoms or fever presents.
- **Wear a Mask:** Wear a face mask at all times while in the workplace for 14 days after last exposure. Employees can use face masks[2] or cloth face coverings.
- **Social Distance:** Maintain 6 feet (2m) from others and practice social distancing.
- **Disinfect and Clean work spaces:** Continue to clean and disinfect areas such as offices, bathrooms, common areas, shared electronic equipment routinely.

- no →

1. "Cautioned" employee will not proceed to the project site.
2. Project Manager will identify another employee to complete the scheduled project site work until the client's position on critical infrastructure guidance is understood or client's policies allow for employee to return.

Upon review of the client policy and/or discussion with the client, will the "cautioned" worker be allowed to proceed with project site work in accordance with the CDC's Critical Infrastructure Guidance?

- yes ←
- no →

Continue using alternate employee.

Do

- Take your temperature before work
- Wear a face covering at all times
- Practice social distancing

Don't

- Stay at work if you become sick
- Share headsets or objects used near face
- Congregate in break room or other crowded places

[1]CDC advises that critical infrastructure workers may be permitted to continue work following potential exposure to COVID-19, provided they remain asymptomatic and additional precautions are implemented to protect them and the community. The U.S. CDC public health recommendations for critical infrastructure/essential workers pertains to critical infrastructure workers in 16 different sectors of work.

[2]Face masks or surgical masks are FDA approved, loose-fitting masks that are fluid resistant and provides the wearer protection against large droplets, splashes, or sprays of bodily or other fluids. Face masks protects others from the wearer's respiratory emissions.

Revised 16 April 2020

ATTACHMENT B

Traffic Safety Plan

Traffic Safety Plan (TSP)

1.0 General

Plan type	Non-Right of Way (Non-ROW)
Project Name:	BMS East Syracuse
Project Number:	30030236
Developer Name:	Brian McCann
Duration of Project (in hours or days):	Ongoing
Time Restrictions (Y/N, if Y describe below):	N
Not Applicable	
Not Applicable	
Not Applicable	NA
Not Applicable	
Not Applicable	NA

☐ Working on multiple roads?

Comments:

2.0 Work Description

Provide a brief description of scope of work:

Work tasks shall include all tasks listed on tab 4. Work locations shall be spread across the entire site. All work tasks (with the exception of the 72 hour pump test) shall occur during daytime hours, and have the potential to be short term to long term in duration. Site workers have the potential to encounter pedestrian traffic as well as forklifts, lawn mowers, delivery vehicles and passenger cars.

3.0 Type and Duration

Work locations on this project will be: Long term work (>8 hours per location)

Non-ROW work will be performed in: Active parking lot

Special traffic conditions may include (select most prevalent): Not applicable

4.0 Traffic Control Layout, Number of Devices Required, and Phasing

The following Non-ROW requirements in the Traffic Safety Handbook applies:

Section 7.4 Long Duration Work in Parking Areas (>8 Hours) (DOT Facts-302c)

The menu below will be blank and is not applicable.

The menu below will be blank and is not applicable.

Non-ROW configuration:
An example non-ROW traffic control configuration for this project is illustrated below. The actual type and number of devices required are specified below. Don't leave vehicle doors open. Don't establish controls within 25 ft of the front or rear of parked large vehicles/rolling equipment without coordinating with the vehicle/equipment operator.



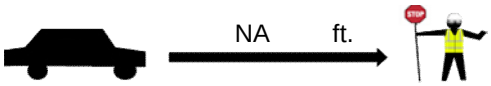
Short Term (<1 Hour)
Channelizing Cones
with Lookout



Intermediate Term (1-8 Hours)
Channelizing Cones with Caution Tape



Long Term (>8 Hours)
Channelizing Cones with Safety Fencing

ROW minimum sign spacing distances for "A", "B" and "C" (as applicable) in referenced DOT Facts.	ROW oncoming traffic minimum site distance required to see Flagger and properly decelerate and stop.
A NA ft. B NA ft. C NA ft.	 NA ft.

ROW Cone Calculation (Values are default. Light grey fields may be modified based on actual road conditions)

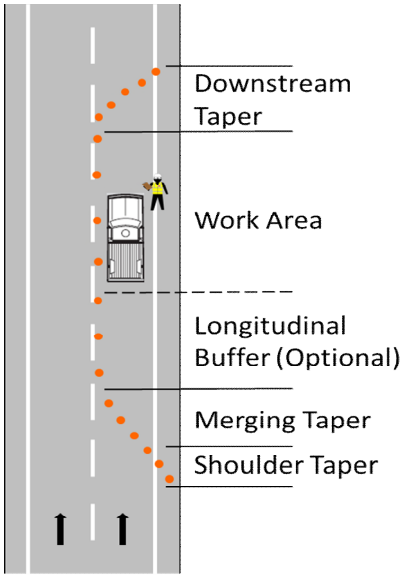
Active work area length (feet)	200
☐ Apply Optional Longitudinal Buffer (ft)?	0
Lane width of offset (feet)	12
Shoulder width of offset (feet)	8
Posted speed limit	NA

☐ **Shoulder Taper**

Taper Length (feet)	NA
Cones Required	NA
Cones Spacing (max., ft)	NA

☐ **Merging Taper**

Taper Length (feet)	NA
Cones Required	NA
Cones Spacing (max., ft)	NA



☐	**Work Area**		
	Cone Spacing (max., ft)	NA	
	Cones Required	NA	Note: Review taper configuration and cone spacing after ROW implementation to ensure traffic is moving efficiently without motorist confusion in the RWZ.
☐	**Downstream Taper**		
	Taper Length (feet)	NA	
	Cones Required	NA	
	Cone Spacing (max., ft)	NA	
	Cones Required (minimum)	NA	

Select the traffic control devices to be used and enter number each required:

Check all that apply:		*Wording or Pictogram*	*Number:*
☐	Warning signs		
☐	Warning signs		
☐	Warning signs		
☐	Stop/Slow paddle		
☐	Red flag		
☐	Drums		
X	Channelizer cone (42 inch height, 10 lb base)		5 to 10
☐	Channelizer cone (42 inch height, 30 lb base)		
☐	Traffic cones (≥ 18 inches tall)		NA
☐	Barricade:		
☐	Flags for cones		
☐	Lights (for night work)		
X	Plastic fencing (rolls)		Long Term Only
X	Caution tape (rolls)		1
☐	Other (specify):		

Non-ROW Phasing:

1) Position truck as shield, if practical

2) Deploy traffic control devices

3) Affix flags, caution tape or fencing

4) Unload project equipment

5) Commence work

6) SSO to maintain controls

7) Remove controls in reverse order

Electronic Device Use Safety

Electronic devices (tablets, laptops and cell phones) used to collect data or document activities in active parking lots must be used in a manner that does not interfere with the user's ability to see and react to vehicle movements in the work area. If this requirement cannot maintained, a spotter must be used. When possible position vehicle to act as a shield. Short-term traffic control scenarios provided by this TSP are not authorized if a spotter is not used.

Reviewed By: _____

HASP Reviewer: _____

ATTACHMENT C

Silica Plan

Silica Exposure Control Plan

Project Name: BMS East Syracuse
Project Number: 30030236
Date: 8/23/2020

Task Description:
Work shall include the installation and abandonment of monitoring wells, vapor sampling ports and soil vapor wells. Work may include locations on asphalt which will require drilling through asphalt. Work will mostly include the mixing and pouring of concrete or grout. Work mostly take place outdoors (except the installation of any sub slab port installations) and will be less than 4 hours in duration per 8 hour shift.

1) *Arcadis Silica Competent Person:* Brian McCann
The above individual will ensure requirements stipulated in this plan are implemented and has the authority to take corrective measures and/or revise this plan to ensure employee, contractor and/or public exposure to silica dust remains below the respirable inhalation time weighted average action level of 25 µg/m3 over an 8-hour period.

2) *What material will the team be working with on this project?*
Cement

3) *The following work activity will be performed on this project which have a potential for silica dust exposure:*

Mixing/pouring

The following controls will be utilized to mitigate exposure to silica dust hazards:
Based on the activity entered above, the following OSHA/Arcadis activity category is:
Arcadis regulated activity

4) *The controls to be utilized include:*
Reasonable care will be taken to control visible dusts and wetting will be the preferred method to control dusts. If wetting cannot be utilized, the Arcadis competent person will design and implement engineering and administrative controls to mitigate the dust hazard prior to directing use of respiratory protection.

4a) *Respiratory Protection:*

	≤4 HRS	>4HRS
Indoors or Enclosed Area:	None	None

	≤4 HRS	>4HRS
Outdoors:	None	None

The Arcadis competent person may require 10 APF respiratory protection based on data and observations available.

Additional Housekeeping Requirements:
Arcadis prohibits dry sweeping or dry brushing where such activity could contribute to employee exposure to respirable crystalline silica unless wet sweeping, HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure are not feasible.

Arcadis prohibits use of compressed air to clean clothing or surfaces where such activity could contribute to employee exposure to respirable crystalline silica unless:
The compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air; or
No alternative method is feasible (requires concurrence with a CIH).

5) Air Monitoring Requirements for Activities with an Assigned Respirator APF Listed in Section 4a.

[X] Real-time air monitoring for silica is not required for this project.

[ ] Real-time air monitoring will be conducted during work activities where employees or contractors are exposed to or have the reasonable probability to be exposed to silica dust hazards. Silica air monitoring will include use of an aerosol monitor equipped with a Dorr-Oliver cyclone kit for respirable dust evaluation. Although not permitted to be the sole method of determining employee exposure, real-time air monitoring for silica will be performed in the employee breathing zone (personal air monitoring) and also performed at the perimeter of the work area (exclusion zone boundary). The results will be documented and submitted to Corporate H&S upon completion of the project. Air samples for laboratory analysis will also be required unless excepted from collection by a CIH.

Aerosol monitor selected for use on this project	N/A
Frequency of air sample collection for laboratory analysis:	N/A
Air samples will be submitted to the following laboratory:	N/A

6) Medical Surveillance

Employees performing work activities where exposure to silica dust is known to be or has a reasonable probability to be above the OSHA 8-Hr TWA action level of 25 µg/m3 will participate in silica medical surveillance in conjunction with their annual HAZWOPER physical. New entrants into the silica medical surveillance program at times when the HAZWOPER physical is not due will coordinate the required surveillance with WorkCare and then maintain the surveillance with their HAZWOPER physical going forward.

7) Additional Instructions

This silica exposure control plan was prepared to document that the tasks currently scoped that may expose workers to RSC present no airborne hazard requiring monitoring and a silica competent person on site. If the scope changes from these current tasks, this plan must be re-evaluated to assess new hazards, and may need to specify a Silica Competent Person associated with the project be on site.

Signatures:

Brian McCann	10/23/2020
Preparer Name Printed	Date

Preparer Signature

ATTACHMENT D

Heat Illness Prevention Plan

Purpose and Scope **Date Completed** **10/23/2020**

The purpose of this document is to serve as a planning tool and implementation guide to assist the project team, onsite personnel, and the Site Safety Officer (SSO) or other designated responsible party to comply with the requirements set forth by **Cal/OSHA Title 8 CCR 3395 Heat Illness Prevention Standard** and the **Washington State Outdoor Heat Exposure Regulations 296-62-09510 thru 09560**.

NOTE: This HASP Supplement is required to be used in California and Washington states. The Arcadis Health and Safety Standards ARC HSIH013 Heat Stress Prevention, and ARC HSGE008 Injury and Illness Prevention Program (IIPP) must accompany this HASP Supplement. To completely address the regulatory requirements for work in CA and WA states these standards are required to be used in association with the project-specific HASP and this supplement.

The scope of this HIPP applies to Arcadis projects which include, but are not limited to: outdoor operations such as contractor oversight, construction, refining, oil and gas extraction, asbestos removal, and hazardous waste site activities and interior work particularly tasks which require employees to wear PPE which can increase the risk for heat stress for the wearer. This HIPP provides guidance to prevent or reduce the risk of work-related heat illness. This HASP Supplement provides site specific instructions for actions to be completed at the project site.

Project sites in other states and provinces are expected to use this HASP Supplement as a Best Management Practice to prevent heat related illness injuries.

Project Site Name	BMS East Syracuse

Authority and Implementation

The following designated individuals have authority and responsibility for implementing the provisions of this program at the project work site indicated above.

Project Manager	William McCune
Site Safety Officer (SSO)	Josh Miller
SSO Designated	

Acclimatization of Personnel for Heat Stress Prevention

The degree to which personnel have been able to physiologically adjust or acclimatize to working under hot conditions affects ability to safely do work. Acclimatized individuals generally have lower heart rates and body temperatures than unacclimated individuals, and sweat sooner and more profusely. This enables them to maintain lower skin and body temperatures at a given level of environmental heat and work loads than unacclimated workers. Acclimatization can occur after a few days of exposure to the hot work environment. OSHA/NIOSH suggests an acclimatization period of 2-3 days for fit personnel. One the 1st day personnel should spend 50% of the day exposed to / working in the hot environment and increasing the amount of work 10-20% based on personnel response to the hot environment and work load.

Procedures for Provisions for Potable Water

The SSO or designee will be responsible for implementing the following when conditions at the site are anticipated to exceed 80 degrees (°) Fahrenheit (F) / 26.6° Celsius (C)

1. Proper hydration is critical to preventing heat related illness and injury. Project sites will maintain an adequate supply of suitably cool, fresh and pure potable water on site/readily accessible to allow each employee to consume 1 quart (1 L) of water per hour, ideally at a rate of four 8-oz (250 mL) cups per hour.

NOTE: Fresh and pure water is defined as being "odor free and suitably cool". Where suitably cool means water being cooler than the ambient temperature but not so cold as to cause discomfort or prevent drinking.

NOTE: Electrolyte replacement drinks or “Sports Drinks” should be used to replace essential minerals lost during sweating. Sports drinks should supplement water intake e.g. one “sport drink” to every three bottles of water (3 waters : 1 sport drink)

2. During the Tailgate Safety Meeting and site briefings identify and communicate the type and location of the water source. The water source must provide suitably cool, fresh, and pure water in sufficient quantity for all employees at the site. Water shall be provided free of charge or expenses will be reimbursed for employees. If the source is potable plumbed water do not complete Item 6 of this Section.

3. Communicate to staff whether all water for the day will be provided at the start of the shift (e.g., 2 gallons / 8 L per employee for an 8-hour shift), or how and when water will be replenished.

NOTE: A sufficient quantity of water must always be present and readily accessible to allow every employee to consume at least 1 quart (1L) of water per hour. It is suggested to have a minimum of three hours supply of water per employee on hand.

4. Water supplies must be positioned as close as reasonable possible to site workers. Placing water only in shaded areas or by toilet facilities is not sufficient, particularly at large work sites or at multi-story construction sites. Drinking water sources need to be close enough to workers to allow for routine consumption per the rate noted above.

5. Inspect the coolers / water dispensers for cleanliness and replenishment of water and cooling ice routinely based on temperatures and staff size. Cooling ice will be stored in clean coolers if added directly to water dispensers.

NOTE: If the site temperature exceeds 90° F / 32° C the frequency of the cooler inspection will increase to verify water remains cool and the water supply is maintained.

6. Oversee the daily inspection and maintenance of coolers to ensure they are kept clean and in good condition.

Potable Water Source & Location

☐	Potable plumbed source	Location:	
X	Bottled water in chilled cooler	Location:	Arcadis Field Vehicle
☐	Drinking water dispenser & cups	Location:	

Procedures for Provisions for Potable Water (Continued)

Check which applies. Must check at least one box, or provide additional detail.

- [X] Ice will be purchased at the start of each day.
- [ ] Ice will be provided by an onsite source or vendor service. Ice to be potable
- [ ] Alternative potable ice source: _____
- [ ] Food safe cleaning product for water cooler.
- [ ] Sufficient amount of drinking water cups for each employee per dispenser.
- [ ] Other items needed: _____

Access to Shade

The SSO or designee is responsible for implementing the following for how shade will be coordinated and provided **when temperatures exceed 80° F / 26° C**.

1. Access to shade must be allowed at all times. Before the start of work, the location of the shade areas, the importance of taking shade breaks, recognizing the signs and symptoms of heat illness, the schedule of shade breaks, and the location of shade break locations (if not portable) will be addressed during each Tailgate Safety Meeting and site briefing.

NOTE: Where required by regulation, shade breaks will be taken at a minimum rate of 10 minutes of shade for every two hour work period. As temperature increases shade breaks will increase in frequency. See the Heat Index table below for Heat Index specific Action Levels defining shade break frequency and duration.

2. The amount of shaded area must be able to accommodate all employees taking a recovery or rest break including employees on meal breaks. The shaded area(s) don't need to provide shade to accommodate **all employees** on a site or working a shift at the same time. An example includes rotating routine breaks among employees. Also, additional portable shade structures can be erected on an "as-needed" basis.

Employees must have enough shaded space so they can sit in a normal posture fully in the shade with enough space to allow for sitting without being in physical contact with each other. Employees who desire access to shade must not be deprived of it due to lack of space.

3. Employees who take a preventative cool-down rest;

(1) shall be monitored and asked if they are experiencing symptoms of heat related illness. (2) shall be encouraged to remain in the shade. (3) shall not be ordered back to work until signs or symptoms of heat illness have abated, but in no event less than 5 minutes in addition to the time needed to access the shade.

If an employee exhibits signs or symptoms of heat illness while taking a preventative cool-down rest the SSO will provide appropriate support (e.g. additional hydration and/or call to WorkCare) or emergency response support as needed based on symptoms.

4. Shade structures will be relocated to follow the crew for moving tasks. Shade structures will be placed within 50 feet of the work area, if practical. Shade structures must be no further than a short walk away (e.g. 2-3 minutes) from the work area. This consideration becomes more critical as the temperature rises above 80° F (26 C).

5. In situations where it is not safe or feasible to provide shade, the SSO will document in the HASP Supplement the unsafe or unfeasible conditions, and include the steps taken to provide alternative cooling measures equivalent to shade.

Unsafe/unfeasible conditions: _____

Alternative Cooling Measures Implemented:

X	Provide vehicles with working air conditioner to all employees for rest breaks / recovery breaks / meal breaks.
X	Provide temporary or mobile shade structure(s) that are either ventilated or open to air movement (Secure against wind.)
	Provide a building / permanent structure(s) in close proximity to the work area with a cooling environment via mechanical ventilation or open to air movement which will be used for shade. (Job trailer, pavilion, manufacturing building, etc.)
	Other:

Monitoring of Weather and Heat Index Table

1. The SSO or designee must check the extended weather forecast in advance of the upcoming work on a weekly basis. Work schedules will be adjusted in advance, taking into consideration whether high temperatures or a heat wave is expected.
Accepted weather forecasting resources include webpages "NOAA.gov" or "weather.com" or see the NIOSH Heat Tool (formerly the OSHA Heat Tool app)

https://www.cdc.gov/niosh/topics/heatstress/heatapp.html

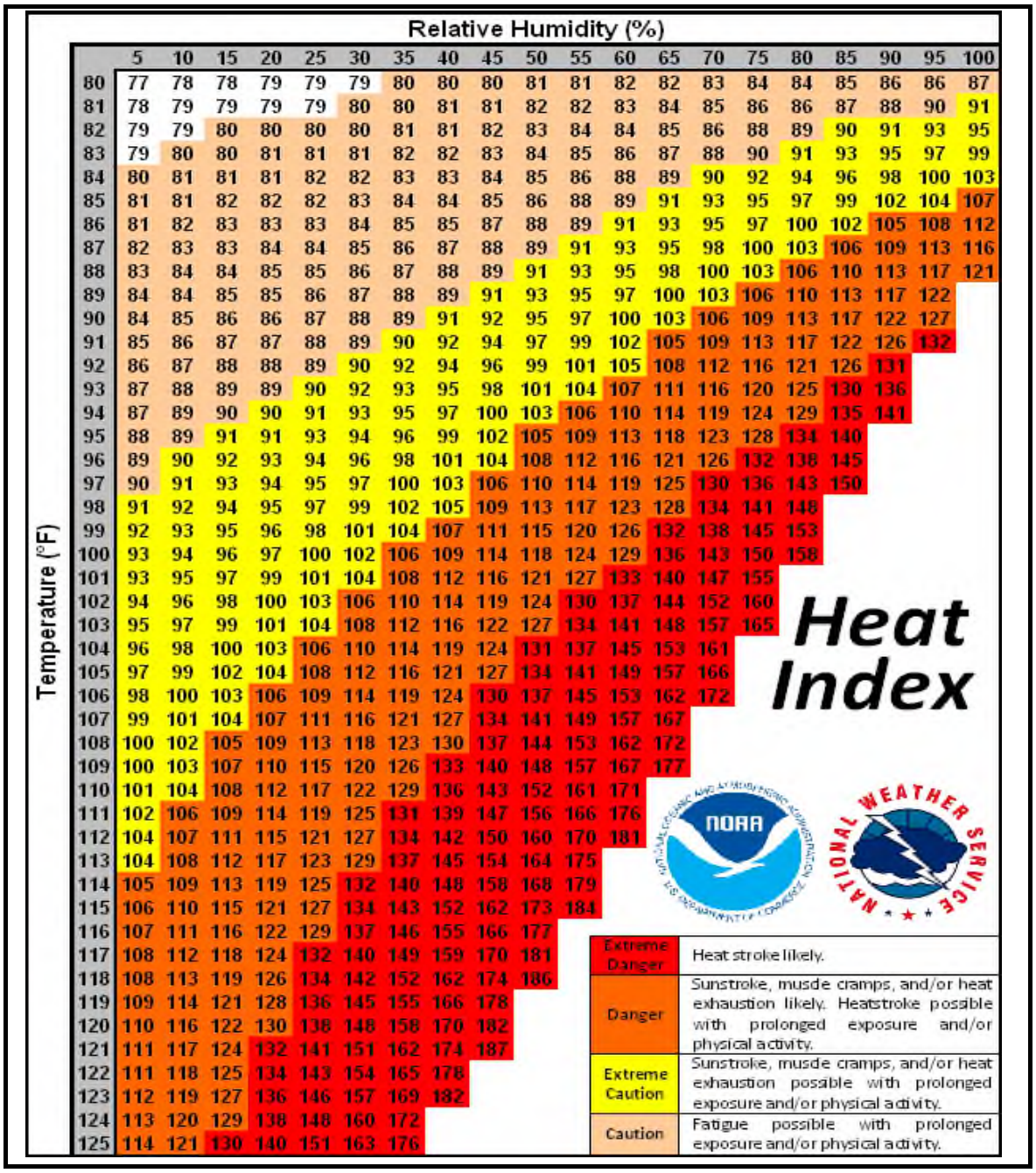
2. Before work starts for the day or shift, the SSO will review the forecasted temperature and humidity for the (exterior) work site and compare conditions against the National Weather Service Heat Index (below) to evaluate the risk level for heat illness. Determination will be made of whether or not workers will be exposed to a combination of temperature and humidity characterized as "Caution", “Extreme Caution”, "Danger" or “Extreme Danger” for heat illnesses.

NOTE: It is important to know the temperature at which these warnings occur. When working outdoors see the Heat Index Table in this supplement for Action Level specific instructions for hazard controls.

3. Where state regulations indicate a thermometer or similar on-site monitoring device will be used at the job site to monitor for sudden increases in temperature. The SSO will be responsible for obtaining a thermometer/weather station prior to the start of work and make it readily visible / accessible where it can easily be monitored throughout the course of the day.

NOTE: If the temperature is **> 80°F (26 C)** shade structures will be opened and made available to workers. If temperature is **≥ 95° F (35 C)** additional preventive measures will be implemented.

Monitoring of Weather and Heat Index Table (Continued)



Temp (°F)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
80	77	78	78	79	79	79	80	80	80	81	81	82	82	83	84	84	85	86	86	87
81	78	79	79	79	79	80	80	81	81	82	82	83	84	85	86	86	87	88	90	91
82	79	79	80	80	80	80	81	81	82	83	84	84	85	86	88	89	90	91	93	95
83	79	80	80	81	81	81	82	82	83	84	85	86	87	88	90	91	93	95	97	99
84	80	81	81	81	82	82	83	83	84	85	86	88	89	90	92	94	96	98	100	103
85	81	81	82	82	82	83	84	84	85	86	88	89	91	93	95	97	99	102	104	107
86	81	82	83	83	83	84	85	85	87	88	89	91	93	95	97	100	102	105	108	112
87	82	83	83	84	84	85	86	87	88	89	91	93	95	98	100	103	106	109	113	116
88	83	84	84	85	85	86	87	88	89	91	93	95	98	100	103	106	110	113	117	121
89	84	84	85	85	86	87	88	89	91	93	95	97	100	103	106	110	113	117	122	
90	84	85	86	86	87	88	89	91	92	95	97	100	103	106	109	113	117	122	127	
91	85	86	87	87	88	89	90	92	94	97	99	102	105	109	113	117	122	126	132	
92	86	87	88	88	89	90	92	94	96	99	101	105	108	112	116	121	126	131		
93	87	88	89	89	90	92	93	95	98	101	104	107	111	116	120	125	130	136		
94	87	89	90	90	91	93	95	97	100	103	106	110	114	119	124	129	135	141		
95	88	89	91	91	93	94	96	99	102	105	109	113	118	123	128	134	140			
96	89	90	92	93	94	96	98	101	104	108	112	116	121	126	132	138	145			
97	90	91	93	94	95	97	100	103	106	110	114	119	125	130	136	143	150			
98	91	92	94	95	97	99	102	105	109	113	117	123	128	134	141	148				
99	92	93	95	96	98	101	104	107	111	115	120	126	132	138	145	153				
100	93	94	96	97	100	102	106	109	114	118	124	129	136	143	150	158				
101	93	95	97	99	101	104	108	112	116	121	127	133	140	147	155					
102	94	96	98	100	103	106	110	114	119	124	130	137	144	152	160					
103	95	97	99	101	104	108	112	116	122	127	134	141	148	157	165					
104	96	98	100	103	106	110	114	119	124	131	137	145	153	161						
105	97	99	102	104	108	112	116	121	127	134	141	149	157	166						
106	98	100	103	106	109	114	119	124	130	137	145	153	162	172						
107	99	101	104	107	111	116	121	127	134	141	149	157	167							
108	100	102	105	109	113	118	123	130	137	144	153	162	172							
109	100	103	107	110	115	120	126	133	140	148	157	167	177							
110	101	104	108	112	117	122	129	136	143	152	161	171								
111	102	106	109	114	119	125	131	139	147	156	166	176								
112	104	107	111	115	121	127	134	142	150	160	170	181								
113	104	108	112	117	123	129	137	145	154	164	175									
114	105	109	113	119	125	132	140	148	158	168	179									
115	106	110	115	121	127	134	143	152	162	173	184									
116	107	111	116	122	129	137	146	155	166	177										
117	108	112	118	124	132	140	149	159	170	181										
118	108	113	119	126	134	142	152	162	174	186										
119	109	114	121	128	136	145	155	166	178											
120	110	116	122	130	138	148	158	170	182											
121	111	117	124	132	141	151	162	174	187											
122	111	118	125	134	143	154	165	178												
123	112	119	127	136	146	157	169	182												
124	113	120	129	138	148	160	172													
125	114	121	130	140	151	163	176													

Extreme Danger	Heat stroke likely.
Danger	Sunstroke, musde cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.
Extreme Caution	Sunstroke, musde cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	Fatigue possible with prolonged exposure and/or physical activity.

Note: The Heat Index table was developed with an expectation of partial shade & light wind conditions present. Work conducted in direct / full sunlight (e.g. no partial shade) and no wind adds up to 15° F (8° C) to the Heat Index evaluation.

Monitoring of Weather and Heat Index Table (Continued)

Heat Index Action Levels. Below are recommended additional controls. Each level of additional controls is additive as the temperature increases.

CAUTION 80° - 90° F (26° - 32° C). Implement one or more of the following measures: Provide and direct hydration, schedule breaks, ensure lightweight clothing is worn, provide break areas with shade / ventilation / air conditioning.

EXTREME CAUTION 90° - 105° F (32° - 40.5° C). Implement all the previous and add one or more of the following: Provide light duty PPE, cooled break areas, shaded work areas.

NOTE: "Light Duty PPE" includes hard hat sun shades, sun hats, dry or wet evaporative cooling vests, microfiber cooling towels / scarves / headbands / hard hat suspension inserts or sweatbands, hard hat neck shades.

DANGER 105 ° - 130 ° F (40.5° - 54.4° C). Implement all the previous and add one or more of the following: cooled work areas, modified work schedule, heavy duty PPE, and personnel physiological monitoring.

NOTE: "Heavy Duty PPE" phase-change cooling vests, gel pack or ice pack equipped cooling vests. Consider engineering controls such as forced ventilation.

EXTREME DANGER ≥ 130° F (≥ 54.4° C). If working at this temperature or greater Stop Work until conditions change or hazards are effectively controlled via the items listed above. At this range of temperatures it is critical to implement personnel vital sign monitoring for determining the appropriate frequency and duration of Work / Rest cycles.

Work / Rest Cycle Duration and Frequency Process

All workers, regardless if they are wearing permeable or impermeable clothing, should be monitored when conditions warrant e.g., when temperatures exceed 80°F / 26.6°C. If impermeable clothing is worn (e.g., not standard cotton/synthetic work clothes), it is a best practice to begin monitoring workers when temps are > 70°F in the work area. Prioritize workers completing strenuous tasks. Prioritization should also apply to work conducted indoors, for strenuous tasks, and/or if additional PPE is worn (such as Level C respiratory protection or(CPC). If impermeable clothing, Level C, or CPC is not worn, follow the Heat Index table instructions and evaluate personnel monitoring as part of the high heat measures. Details provided below for appropriate work/rest cycle development with the default rest cycle being a 15-minute interval for every hour when temperatures exceed 90°F.

NOTE: *Warning signs include: When a person's sustained (e.g., several minutes) heart rate exceeds 180 beats per minute (bpm) minus their age (e.g., 180 - age = X) for individuals with normal cardiac performance per their physician; or a body core temperature exceeds 101.3°F / 38.5°C for acclimatized workers or 100°F / 38°C for unacclimated workers; a recovery heart rate at 1 minute after a peak work effort is greater than 120 bpm; or there are symptoms of sudden and severe fatigue, nausea, dizziness, or lightheadedness.*

Suggested Frequency and Duration of Work / Rest Cycles Applying Physiological Monitoring of Acclimatized Personnel

Adjusted Temp. (1)	Permeable PPE (2)	Impermeable PPE (3)
≥ 90° F / 32° C	After ea. 45 mins. of work	After ea. 15 mins. working
87.5-90° F / 30.8-32.2° C	After ea. 60 mins. of work	After ea. 30 mins. Working
82.5-87.5° F / 28.1-30.8° C	After ea. 90 mins. of work	After ea. 60 mins. Working
77.5-82.5° F / 25.3-28.1° C	After ea.120 mins. of work	After ea. 90 mins. Working
72.5-77.5° F / 22.5-25.3° C	After ea.150 mins. of work	After ea. 120 mins. Working

NOTES:

(1) Adjusted air temp (ta adj) calculation: ta adj F = ta F + (13 x % sunshine). Measure the air temperature (ta) with a thermometer (shielded from radiant heat). Estimate the percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

(2) Permeable PPE consists of cotton clothing with long sleeves and pants or breathable coveralls.

(3) Add 1.8 °F for Tyvek coveralls; add 5.4 °F for heavy clothing; add 19.8 °F for impermeable/semi-impermeable PPE - Level A/B suits)

Heart Rate Monitoring

When conducting heart rate monitoring, first record a resting heart rate to establish the individuals daily baseline heart rate. Count the radial pulse (located on the inside of the wrist below the thumb) during a 30 second interval before the start of work to establish a baseline heart rate. During rest cycles count the heart rate as early as possible at the beginning of the rest cycle and again 3-5 minutes later. The heart rate should fall and soon approach the individuals baseline heart rate.

- If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
- If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.

Body Temperature Monitoring

Use an oral, inner ear, or an infrared type thermometer to measure the body temperature at the end of the work period (If using an oral thermometer record temperature before drinking liquids).

- If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period.
- If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following work cycle by one-third.
- Do not permit a worker to wear a semi-permeable or impermeable garment when his/her oral temperature exceeds 100.6 °F (38.1 °C).

Procedures for High Heat Conditions and Heat Waves

These procedures are additional preventative measures to be implemented when the temperature is > 95° F (35° C). The SSO or designee is responsible for ensuring effective observation and monitoring of employees during periods of high heat by implementing one or more of the following procedures:

1. SSO or designee will supervise 20 or fewer employees.

2. The “Buddy System” is mandatory. Conduct routine checks for early signs of Heat Illness. Set and verify routine consumption of water & sports drinks in a 3:1 ratio.

3. Maintain regular communication between Project Manager or SSO / designee and field staff (e.g. via mobile phone, radio or another effective means) for observation of early signs of heat illness.

4. Designate one or more employees as authorized to contact emergency medical services and communicating that if no designate is identified and the SSO is unavailable that any employee can call for emergency medical assistance.

5. Modify work schedule to avoid hottest parts of the day (e.g. start work earlier in the AM, stop work for the hottest hours of the day, conduct work during the evening).

Additionally, tailgate Safety Meetings will include a review the high heat procedures, encourage employees to drink plenty of water, and remind employees of the importance to take a preventative or recovery cool-down rest when necessary.

Employees will be observed for alertness and signs and symptoms of heat illness at regular intervals to be documented in the field book or field log.

The “Buddy System” must be implemented. Particular attention needs to be paid to new employees or employees who have yet to acclimate to high heat conditions. Additionally, frequent communication will be maintained with employees working by themselves (via cell phone or two-way radio), to evaluate early warning signs and symptoms of heat illness.

When the SSO is not available, an alternate responsible person must be assigned to look for signs and symptoms of heat illness. Such a designated observer will be trained and know what steps to take if heat illness occurs.

"Heat Wave" Procedures

A “heat wave” as defined by NOAA, is a period of abnormally and uncomfortably hot and unusually humid weather.” Typically, a heat wave lasts 2 or more days. A "Heat Wave" as defined for the purposes of this Standard is when temperatures are sustained above 80° F / 26° C.
During a heat wave or if site conditions indicate the potential for “Extreme Caution”, "Danger" or “Extreme Danger” per the NOAA Heat Index Table the following steps will be taken:

Work schedules will be modified to protect workers from heat illnesses. The SSO or designee in coordination with the project team, will use their Stop Work Authority and evaluate the following actions and document the action in the daily field log

1. Modify work hours to exclude the hottest parts of the day.

2. Reschedule work or specific tasks that require strenuous exertion or Stop Work.

If schedule modifications are not possible, the Heat Illness Prevention Plan will be reviewed before work resumes. At a minimum, procedures for heat illness prevention, the provisions of the high heat procedures, the weather forecast and emergency response protocols will be reviewed.

Employees will be provided with additional water and rest breaks and will be observed more frequently. During work activities and rest breaks, employees will be observed for signs and symptoms of heat illness.

All employees will maintain frequent communication with the SSO or designee, who will be monitoring workers for possible symptoms of heat illness. In the event of large project sites where the SSO may be unable to be near the workers (to directly observe or communicate with them), then communication via a cell phone or radio may be used for this purpose provided reception in the area is reliable.

Procedure for Emergency Response

Emergency procedures include recognizing the symptoms of heat related illness. A critical step also involves ensuring that effective communication is established either through voice, direct observation or electronic means such as via mobile phones or 2-way radios. In an emergency situation it is critical that employees understand the process and contact information for requesting emergency medical support. The reception coverage for the site must be evaluated and understood to ensure adequate communication is in place across the project site. During a heat wave or hot temperatures, workers will be reminded and encouraged to immediately report to the SSO any signs or symptoms of the onset of heat stress they are experiencing.

Procedure for Emergency Response (Continued)

The SSO or designee is responsible for implementing the following procedures for emergency response. These procedures include, but are not limited to, the following:

1. Prior to assigning staff to a particular work site, during the Tailgate H&S Safety Meeting all site workers will review the HASP along with the identified Hospital precise directions (such as streets or road names, distinguishing features, and distances to major roads), to avoid a delay of emergency medical services.

2. Prior to work, efforts will be made to ensure that a qualified, appropriately trained and equipped personnel are consistently available to render first aid.

3. Prior to the morning Tailgate Safety Meeting, an evaluation of whether or not a language barrier is present at the site for understanding the necessary preventative measures and emergency notifications procedures can be completed. Necessary steps will be taken (such as assigning the responsibility to call emergency medical services to the SSO or an English speaking worker) to ensure that emergency medical services can be immediately called in the event of an emergency.

4. All SSOs and supervisors will carry cell phones or other means of communication to ensure that emergency medical services can be called. Routine checks will be made to ensure the devices are allowed on site, have adequate reception across the site, and are functional prior to each shift.

5. When an employee reports symptoms, or displaying symptoms of possible heat illness, steps will be taken immediately to keep the affected employee cool and comfortable. Evaluate whether 1st aid is to be administered or emergency services are to be contacted or the employee is to be taken to an emergency facility for care.

Procedure for Handling a Sick Employee

Signs of Heat Stress: Excessive fatigue, heavy sweating, headaches, abdominal and/or upper thigh cramps, mild dizziness, elevated pulse.
Signs of Heat Exhaustion: Cool, moist, pale or flushed skin, nausea or vomiting, disorientation or confusion.
Signs of Heat Stroke: Hot, red skin which can feel dry to the touch, or moist from overexertion, changes in consciousness, rapid or weak pulse, shallow rapid breathing.

The SSO or designee is responsible for implementing the following procedures for evaluating and providing care for a sick employee:

1. When an employee displays signs or symptoms consistent with the heat related illness, the SSO or designee will check the sick employee and determine whether resting in the shade and drinking cool water will suffice or if emergency service providers will need to be called.

Procedure for Handling a Sick Employee (Continued)

If determined to be **a non-emergency** (e.g. heat cramps or heat stress) the SSO will contact **WorkCare Injury Assistance Hotline 1-888-449-7787** for 1st aid medical assistance. In the event of the injury being an emergency, or potentially (e.g. Heat Exhaustion or Heat Stroke) contact emergency support services.

2. When an employee displays possible signs or symptoms of heat illness and no trained first aid worker or supervisor is available at the site, emergency service providers will be called.

3. Emergency service providers will be called immediately if an employee displays signs or symptoms of advanced stage heat related illness like Heat Exhaustion or Heat Stroke (loss of consciousness, incoherent speech, convulsions, red and hot face) or does not get better after drinking cool water in intervals of 8 ounces every 15 minutes and resting in the shade. While the ambulance is in route, assign a person to care for the injured, first aid will be administered (cool the worker by placing them in the shade, remove excess layers of clothing, place ice pack in the armpits and groin area and fan the person). A worker determined to be suffering an advanced stage of heat related illness will not be allowed to leave the site except under medical care, or as directed by a medical professional.

4. If an employee displays signs or symptoms of advanced stage heat related illness (loss of consciousness, incoherent speech, convulsions, red and hot face), and the work site is located more than 20 minutes away from a hospital, call emergency service providers, communicate the signs and symptoms of the victim, and request an Air Ambulance if necessary.

Revisions, notes, amendments, and clarifications specific to this plan will be detailed in the space below:

ATTACHMENT E

Forms

Task Improvement Process

General

Observed Company:

Observation Type:

TIP Form: H&S Field Multi-Task (General)

Task Observed:

Observee Name:

Observer Name:

Observation Date:

Project Number: 30030236

Project Name: BMS East Syracuse

Supervisor:

Equipment On Site:

Pertinent Information:

Observation

Task	Correct	Questionable	Comments
General			
PPE worn according to HASP/JLA specifications and inspected before use?			
STOP work authority used where appropriate?			
Body Use/Positioning			
Proper lifting/pushing/pulling techniques used (no awkward positions/posture; no twisting or excessive reaching; no straining; no excessive weight; load under control/stable; etc.)?			
Body parts away from pinch points (clear or protected from being caught between objects/equipment or from contacting sharp objects/edges, etc.)?			
Body parts not in the Line of Fire (protected from being struck by traffic, equipment, falling/flying objects, etc.)?			
Work Procedures/Environment			
Correct type and number of barricades/warning devices/cones?			

Communication with others when necessary (hand signals, flags, etc.)?			
Right tools and equipment selected for the job and inspected before use?			
Tools and equipment used properly?			
Housekeeping performed (work areas and pathways clear of hazards, uneven surfaces addressed, etc.)?			
Slip/trip/fall hazards addressed (path selected and cleared, eyes on path, speed footing, etc.)?			
Proper energy control (electrical systems grounded, lock out/tag out performed, isolated, cords/fixtures in good condition, GFCI inspected and utilized when appropriate and used properly, etc.)?			
Protected from overhead/underground utilities (proper clearance, properly marked, spotters as necessary, etc.)?			
Safe work on/near water (appropriate flotation device, appropriate boat for body of water and operation of boat, etc.)?			
Chemical/Radiation protection (decontamination zones set up properly, air monitoring, completed, and logged, etc.)?			
Fall from elevated height prevention (maintains 3-points of contact, appropriate ladder, mounting/dismounting vehicle/equipment, fall arrest system, etc.)?			
Any additional safety issues identified:			

Tip Summary **Enter details of the TIP and follow up discussion provide details on how any questionable items were resolved.**

Discussion following the TIP led by: _____

Date of follow-up discussion: _____

Positive Comments:

Discussion Summary Completed:

- ☐ Supervisor Led
- ☐ Peer to Peer
- ☐ Arcadis Employee to Subcontractor

Summary of Questionable Items

Action Items (Optional) Assign appropriate action items based on the observations made. You can add more than one action item if needed.

Item #	Action Item	Responsible Person	Due Date	Comp. Date
1				
2				
3				

Standard Review

Reviews to be performed after entry of this TIP into 4-Sight.

Quality Review

Quality Reviews to be performed after entry of this TIP into 4-Sight.

Field Validation and Verification

Use the 4-Sight generated copy of this TIP to perform field V&V activities.

Air Monitoring Documentation Form

ARCADIS Design & Consultancy for natural and built assets

PID Model: _____ Monitor Frequency: _____

LEL/O_2 Model: _____

CIT Model: _____

Dust Mon. Model: _____

Air Monitoring Results

Date	Time	PID (units)	O_2 (%)	LEL (% LEL)	CIT (ppm)	Dusts (mg/m^3)	Location

CIT = Colorimetric Indicator Tube
LEL = Lower Explosive Limit
mg/m3 = Milligram per cubic meter
O2 = Oxygen
ppm = Part per million
% = Percent
PID = Photoionization Detector

PID Calibration Log

ARCADIS Design & Consultancy for natural and built assets

Zero Gas Source: ____________________ Instrument Type: ____________________ PAGE ____ of ____

Lot Number/Expiration Date: ____________________ Serial Number: ____________________

Calibration Gas Source: ____________________ Instrument Type: ____________________

Lot Number/Expiration Date: ____________________ Serial Number: ____________________

Concentration: ____________________ ____________________

Instrument Number	Date	Time	Zero Cal. OK (Y/N)	Calibration Gas Reading	Comments	Calibration w/in 2% (Y/N)?	Alarms Set (Yes/No)?	User Initials

THIS FORM MUST BE ENTIRELY COMPLETED PRIOR TO BEGINNING ANY INTRUSIVE WORK

Project Name: BMS East Syracuse Start Date:

Project #: 30030236 End Date:

Utility markings valid for 15 days. Initiate clearance renewal 5 days prior to expiration for ongoing work

PRE-FIELD WORK REQUIREMENTS

DigSafe 811 notified 48-72 hrs. in advance of work? [ ] DigSafe Ticket #:

Ticket Expiration Date: State Utility Laws: www.commongroundalliance.com/map

Ticket(s) Attached(Y/N)? [ ] List utility owners notified via DigSafe 811 & response status:

List addt'l. utilities requiring notification not included in DigSafe811 Notice:

Review task details w/ private utility location subcontractor. ID work areas, clearance equipment needed, depth of clearance needed, types of features, utilities, anticipated/known/unknown. Verify DigSafe 811 markings to confirm public utility clearance.

Private Utility Locator Name, if used: AUS onsite meeting (Y/N)? [ ]

FIELD WORK REQUIREMENTS

This portion of the checklist must be completed on site. AUS staff must have a minimum of one year of field experience in identifying utilities to complete the checklist. Field staff will review the completed checklist with PM or designee prior to beginning intrusive work.

Heavy equipment/mechanized intrusive work w/in the Arcadis Tolerance Zone (utility or structure present within 30-in. of point of work) REQUIRES pre-approval by Corporate H&S prior to working at all such locations. STOP WORK if the Arcadis Tolerance Zone work has not been approved.

List work type & locations for utility location and clearance as applicable to this checklist:

3 Reliable Lines of Evidence are REQUIRED for EACH INTRUSIVE LOCATION prior to starting any subsurface intrusive work. Check corresponding boxes below to document utility clearance efforts.

[ ] OneCall/DigSafe 811 Public Utility Locate (required by State law for subsurface work)

811 is only reliable as a Line of Evidence when working in/adjacent to a public ROW or easement.

Marking type: [ ] Paint [ ] Pin Flags/Stakes [ ] Other: [ ] None

[ ] Client provided maps/drawings (Y/N)? [ ] Maps/drawings not provided (Y/N)?

[ ] Client Clearance (Y/N)? Name(s)/Affiliation(s):

[ ] Interviews (Y/N)? Name(s)/Affiliation(s):

[ ] Specific subsurface feature types and depths provided by person interviewed (Y/N)?

Details provided:

[ ] Site Inspected (Y/N)? (document on Pg. 2.) Photo Document Marked Utilities & Structures

[ ] Public records/Client Dwgs/As-Builts (Y/N)? Type:

List private locator tools used: [ ] Radio Freq. Detection [ ] Electromagnetic [ ] GPR

[ ] Metal Detector [ ] Acoustic Pipe Locator [ ] Downhole sonde Other:

[ ] Soft Dig Methods used (Y/N)? [ ] Hand auger [ ] Probing [ ] Hand tools (shovel/rake)

[ ] Air knife [ ] Hydro Knife [ ] Potholing/Vacuum extraction

[ ] Other soft dig tools used (Y/N)? If Yes, list here:

ALL BOXES BELOW MUST BE COMPLETED BEFORE PROCEEDING

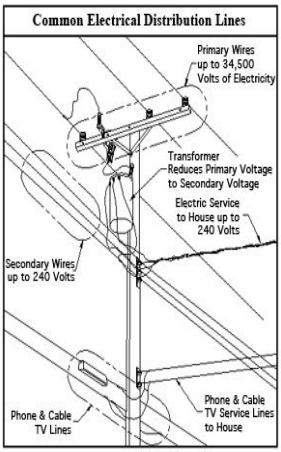
Site inspection also requires investigating vicinity outside of the work area for structures and utilities.
Noting "YES" requires addt'l. investigation. Utilities must be field marked prior to intrusive work.

Is the utility present (Y/N)?		Utility Color Code
	Utilities entering/exiting structures?	No Color
	Intrusive work area marked out?	White
	Structural features above or below?	White
	Public natural gas line or meter?	Yellow
	Private natural gas laterals/feeders?	Yellow
	Public electrical service?	Red
	Conduit from meter or on wall?	Red
	Conduit from poles into ground?	Red
	Poles/devices w/ no visible lines?	Red
	Overhead electrical lines?	Red
	Solar arrays or wind turbines?	Red
	Public water line(s)?	Blue
	Private water line(s) or lateral(s)?	Blue
	Water meter onsite?	Blue
	Fire hydrants/post indicator valves?	Blue
	Irrigation system control box/valve?	Blue
	Sprinkler heads, drip lines, vaults?	Blue
	Water dispensers, fill stations?	Blue
	Telecomm. overhead or buried?	Orange
	Telecomm. ground box or relays?	Orange
	Telecomm./security CCTV devices?	Orange
	Public sanitary sewer pipes?	Green
	Combined sanitary/storm pipes?	Green
	Private sanitary laterals/clean outs?	Green
	Restrooms, kitchens, wash bays?	Green

Is the utility present (Y/N)?		Utility Color Code
	Evidence of stormwater network?	Green
	Curb drains/catch basins/manholes?	Green
	Stormwater culverts, outfalls?	Green
ABOVEGROUND Features Present?		
	Transportation tunnels/structures/markers present?	
	Overhead electrical lines?	Red
	< 50 kV w/in 10 ft of work area?	Red
	>50-200 kV w/in 15 ft of work area?	Red
	>200-350 kV w/in 20 ft of work area?	Red
	>350-500 kV w/in 25 ft of work area?	Red
	>500-750 kV w/in 35 ft of work area?	Red
	>750-1000 kV w/in 45 ft of work area?	Red
	Aboveground fire suppression?	Blue
	Aboveground communications?	Orange
	Aboveground chases/racks/trays?	Orange
	Private/Remediation system lines?	Various
	Unclassed utilities/anomalies?	Pink
	Warning signs/stakes/markers present?	
	Heavy Equipment: Mark travel route for overhead, next to route, and/or under route (e.g. crush risk) utilities.	
Signs of other utilities/ground disturbance		
	Signs of asphalt or concrete disturbance/repair?	
	Any ground subsidence or change in vegetation?	
	Unknown manholes or valve covers in work area?	

Tips for Thorough Utility Location (HSS Section 5.6):

1. Don't forget to look up for utilities
2. Be on-site with Private Utility Locators.
3. Ask Private Locators to "confirm" other's markings.
4. Also clear alternate/backup locations
5. Mark all known utilities.
6. No hammering, no pickaxes, no digging bars, no shortcutting.
7. No excessive turning or downward force of hand tools, especially hand augers.
8. Utilities may run in or directly under asphalt/concrete
9. Heavy equipment may damage shallow utilities. Especially during clearing and grubbing.
10. Use spotter for heavy equipment near aboveground utilities?



☐ Utilities & Structures Checklist reviewed by the PM or Designee (Y/N)? *If no, STOP WORK call PM*

PM or Designee Name: _____

Name and Signature of person completing the checklist: _____

Date of checklist review / update: _____

ALL SUSPECT UTILITY STRIKES REQUIRE CORPORATE H&S NOTIFICATION WITHIN 24 hrs. OF KNOWLEDGE OF STRIKE WITH A CONFIRMED RESPONSE FROM CORPORATE H&S.

Arcadis Weekly Vehicle Inspection Form

Vehicle # / License Plate # | | **Lease Plan # / Last 6 of Vin #** |

	Inspection Date												
	Odometer reading												
	Driver / Inspector Name												
	Check the appropriate box and enter repair date for identified repairs:	OK	Needs Repair	Repair Date	OK	Needs Repair	Repair Date	OK	Needs Repair	Repair Date	OK	Needs Repair	Repair Date
Interior	Horn operational												
	Door Locks operational												
	Seat Belts in good repair												
	Seats and Seating Controls												
	Steering Wheel - No Excessive Play												
	Interior Lights and Light Controls												
	Instrument Panel/Gauges												
	Wiper Controls operational												
	Heat/Defrost/Air Conditioning working												
	Rear View Mirror present												
	Backup Camera/Sensors working												
	Jack and Lug Wrench present												
Exterior[1]	Lights and Signals operational												
	Tires properly inflated/good tread depth												
	Spare Tire properly inflated												
	Doors operational												
	Windows Not Cracked/Damaged												
	Side View Mirrors												
	Body Panels and Bumpers												
Engine & Brakes	Engine Start & Running Smoothly												
	Fluid Levels, No Noticeable Leaks												
	Belts tight, no cracks												
	Brakes operational, no squeaking												
Emergency Equipment[2]	First Aid Kit, inspected weekly												
	Fire Extinguisher properly secured												
	Fire Extinguisher inspected weekly												
	Orange/Yellow emergency warning light												
	Roadside Assistance Information												
	Recommend spotter cones available												
Cargo	Cargo Secure and Properly Distributed												
	Securing Devices in Good Condition												
Registration	License Plate /Tags												
	Registration and Insurance												
	City/State Inspection Decal												
	Lease Plan information/Fuel Card												

[1] **Note all damages to the vehicle on the back of this page**

[2] **Emergency Equipment required per Motor Vehicle Standard ARC HSGE024**

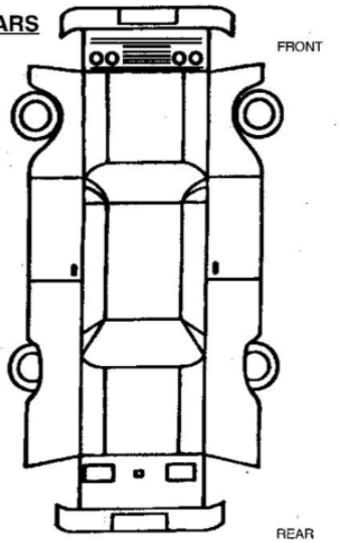
Note All Vehicle Damage Below

All Vehicle Damage must be reported to Sue Berndt (Corporate Legal), Andrew McDonald (Corporate H&S), and Roger Elliot (Corporate Fleet Manger)

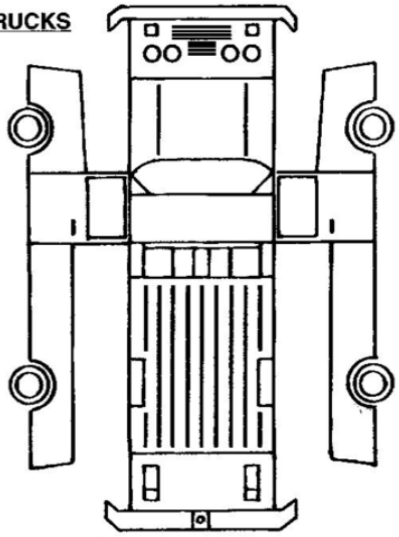
CODES:

B-BENT
BR-BROKEN
BU-BULGE
C-CHAFED
CH-CHIPPED
CPM-COVERED WITH PROTECTIVE MATERIAL-UNABLE TO DETERMINE DEFECTS IF ANY
CSA-CHAFED AND SCRATCHED ALL OVER
CR-CRACKED
D-DENTED
DMC-DUST AND MUD COVERED UNABLE TO DETERMINE OTHER DEFECTS IF ANY
G-GOUGED OR CUT
GC-GLASS CRACKED
HS-HAIRLINE SCRATCH
M-MISSING
P-PUNCTURED
R-RUSTY
S-SCRATCHED
SC-SCRAPED
SM-SMASHED
ST-STAINED AND/OR SOILED
T-TORN

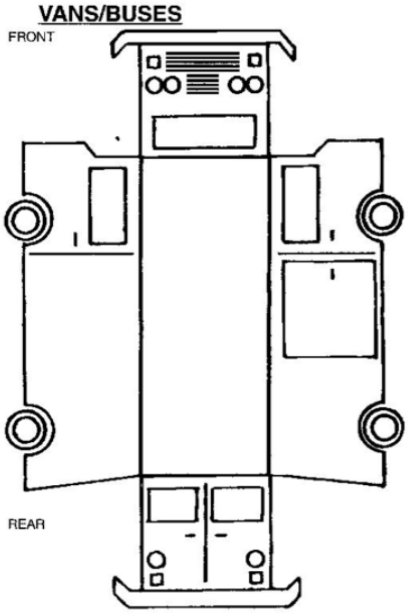
CARS



TRUCKS



VANS/BUSES



-INDICATE ON DIAGRAM-
-GIVE DIMENSIONS-
-CIRCLE WHERE APPLICABLE-

Notes:

Tread guide: If a tread gauge is not available coins may be used to determine remaining tread. 2/32” is the minimum by law in most states (top of Lincoln’s head on penny), 4/32” is minimum recommended for wet surfaces (top of Washington’s head on quarter), 6/32” is minimum recommended for snowy surfaces (top of Lincoln Memorial on penny).Vehicle tires should be replaced if the tread depth is less than 6/32”.



2/32” remaining 4/32” remaining 6/32” remaining

Reference JSA 10907 For Weekly Vehicle Inspection

Arcadis Visitor Acknowledgement and Acceptance of HASP Signature Form

By signing below, I waive, release, and discharge the owner of the site and Arcadis and their employees from any future claims for bodily and personal injuries which may result from my presence at, entering, or leaving the site and in any way arising from or related to any and all known and unknown conditions on the site.

Printed Name	Signature	Company	Date/Time On Site	Date/Time Off Site

ATTACHMENT F

JSAs

Job Safety Analysis

General

JSA ID	HASP 1	**Status**	Complete
Job Name	General Industry-Driving - passenger vehicles	**Created Date**	11/3/2020
Task Description	Driving a car, van, or truck on public roadways.	**Completed Date**	11/03/2020

Client / Project

Client	Bristol Myers Squibb
Project Number	30030236
Project Name	BMS East Syracuse
Project Manager	#REF!

User Roles

Role	Employee	Due Date	Completed Date
Developer	Brian McCann	11/3/2020	11/3/2020
HASP Reviewer	Zuck, Daniel	11/3/2020	11/3/2020
Quality Reviewer			

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Pre-Trip Inspection	1	Failing to perform pre-trip inspections may cause mechanical failure, accident or injury.	Perform walk around of vehicle with particular attention to tire inflation and condition. Check lights, wipers, seatbelts for proper operating condition. Properly adjust seat and mirrors prior to vehicle operation. Use or review vehicle inspection checklist as required under the MVSP.	ARC HSGE024 Motor Vehicle Safety Standard (MVSP)
		2	Scrapes, cuts, burns to hand if inspecting engine fluids and/or tires. Eye splash hazard if inspecting engine fluids. Pinch or crush hazards when opening or closing hood, trunk, or tailgate.	Wear protective gloves and safety glasses as described below when checking under hood or tires. Use TRACK and keep hands clear when opening/closing hood, trunk, or tailgate to avoid crush or pinch hazard.	
		3	Struck by other vehicles while walking around vehicle performing inspections.	Wear high visibility vest, shirt, or coat while performing inspections in parking lots or other areas with a traffic hazard. Remain vigilant of moving vehicles or equipment in area, face oncoming vehicles to extent practical.	
		4	Improperly secured cargo may dislodge creating injury, property damage, or road hazard.	Ensure all cargo is properly secured to prevent movement while the vehicle is in operation. This includes cargo in the cab of the vehicle.	
2	Driving a motor vehicle on public streets	1	Failing to observe traffic flow ahead increases risk of hard braking resulting in potential impact of vehicle ahead, being struck by another vehicle from behind, and decreases decision making time.	Use Smith System Key #1, "Aim High in Steering". **Look ahead (15 seconds if possible) to observe traffic flow and traffic signals.** Adjust speed accordingly to keep vehicle moving and avoid frequent braking. Select lane of least traffic and adjust speed based on observed signal timing when possible. Avoid following directly behind large vehicles that obscure view ahead.	Smith System "5-Keys" is a registered trademark of Smith System Driver Improvement Institute, Inc.

		2	Failing to observe vehicles, pedestrians, bicyclists, and other relevant objects in vicinity of your vehicle increases risk of side swipes, rear ending, and third party injury.	Use Smith System Key #2, "Get the Big Picture". **Maintain 360 degrees of awareness around vehicle.** Check a mirror every 6-8 seconds, maintain space around the vehicle, choose a lane that avoids being boxed in. Look for pedestrian activity ahead in crosswalks or sidewalks. Watch for construction zone approach signs and act early by executing lane changes and reducing speed.	
		3	Failing to keep your eyes moving increases risk of not seeing relevant vehicles, pedestrians, and objects in your vicinity that may impair your ability to make timely and appropriate driving decisions and also increases risk of accident.	Use Smith System Key #3, "Keep Your Eyes Moving". **Move your eyes every 2 seconds and avoid staring while evaluating relevant objects.** Scan major and minor intersections prior to entering them. Check mirrors.	
		4	Failing to maintain space around and in front of your vehicle increases risk of striking another vehicle or being struck by another vehicle. Insufficient space shortens time for effective driving decision making resulting in increased accident risk.	Use Smith System #4, "Leave Yourself an Out". **Use 4 second rule when following a vehicle.** Avoid driving in vehicle clusters by adjusting speed and using lanes that permit maximum space and visibility. When stopped, keep one car length space in front of vehicle ahead or white line.	
		5	Failing to communicate with other drivers and pedestrians increases risk of striking vehicles, pedestrians, or being struck by other vehicles, especially from the rear.	Use Smith System Key #5, "Make Sure They See You". **Brake early and gradually when stopping to reduce potential of being rear ended.** Keep foot on brake while stopped. Use turn signals and horn effectively. Establish eye contact with other drivers and pedestrians to extent practical. Use vehicle positioning that promotes being seen.	
		6	Distractions within the vehicle takes focus off driving, increases risk of accident decreases time for making effective driving decisions.	**Cell phone use (any type or configuration) is prohibited while the vehicle is in motion.** Familiarize yourself with vehicle layout and controls (radio, temperature controls, etc.) prior to operating unfamiliar vehicles. Set controls prior to operating vehicle. Use GPS in unfamiliar areas to avoid use of paper maps/directions while driving. Set GPS prior to vehicle operation. Pull over and stop to modify GPS functions. Avoid consuming food or drink while driving.	
3	Parking	1	Parking vehicle in areas of clustered parked vehicles or near facility entrance may impair visibility to oncoming traffic in lot and increase exposure to pedestrian traffic.	**Use pull through parking or back into parking space when permitted or practical.** When practical and safe to do so, park away from other vehicles and avoid parking near the facility entrance or loading docks. If available, use a spotter to aid in backing activity. Back no further than necessary and back slowly. Get out and look (GOAL) if uncertain of immediate surroundings. Tap horn prior to backing.	

PPE Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses	While checking engine or tires	Required
Hand Protection	work gloves (specify type)	Leather or equivalent checking engine or tires	Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
	other	Vehicle kit (applies to company trucks)	Required
Miscellaneous	fire extinguisher	Applies to company trucks	Required
	first aid kit	Applies to company trucks	Required

Job Safety Analysis

General

JSA ID	10307	**Status**	(3) Completed
Job Name	Environment-Groundwater Sampling and Free Product Recovery	**Created Date**	11/25/2013
Task Description	Gauging and Bailing	**Completed Date**	12/23/2013
Template	False	**Auto Closed**	True

Client / Project

Client	BP Amoco Corp
Project Number	CI0010670036
Project Name	Former ECI Refinery 2013
PIC	DIAS, KEITH
Project Manager	TOKARSKI, ADAM

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Bartelt, Scott J	12/16/2013	11/25/2013	Granzeier, Timothy	☑
HASP Reviewer	Etscheid, Douglas H.	12/9/2013		Briscoe, James G	☑
Quality Reviewer	Rogers, Edward F	12/24/2013	12/24/2013	Kellner, Megan E	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Set up work zone and gauging equipment	1	Driving - Personnel could be hit by vehicle.	Establish work area. Position vehicle to protect field crew from site traffic. Use vehicle flashers. Unload as close to work area as safely possible. Use traffic cones.	
		2	Gravity - Sampling equipment, tools and monitoring well covers can cause tripping hazard.	Maintain good housekeeping and use TRACK to assess hazards and change, as necessary.	
		3	Environment - Hot or cold weather, rain, snow, icy conditions, lightning.	Wear appropriate clothing for weather. Take breaks as necessary to warm up/cool down. Seek shelter in extreme weather conditions. Know location of emergency gathering points.	
		4	Biological - Insects, plants and animals. Radiation - Sun exposure.	Use appropriate insect repellants, sunscreen and wear long sleeve clothing. Clear work area of vegetation prior to work activities (See Site Vegetation Clearing JSA).	
2	Open and gauge wells.	1	Motion - When squatting down to gauge well, personnel can be difficult to see by traffic.	Wear Class II traffic vest. Use buddy system or traffic cones if needed.	
		2	Pressure - Pressure can build up inside well causing cap to release under pressure.	Keep head away from well cap when removing. Use pressure relief valves on wells (if present) before opening well.	
		3	Motion - Lifting equipment	Unload as close to work area as safely possible. Use proper lifting and body positioning techniques. Do not carry more than you can handle. Get help moving heavy or awkward equipment.	
		4	Mechanical - Pinch points on well vault	Use correct tools to open well vault/cap. Wear leather gloves when removing well vault lids.	
		5	Chemical - Exposure to impacted groundwater/free product	Wear appropriate PPE including chemical resistant gloves, safety glasses and long sleeve clothing.	
		6	Biological - Insects, plants and animals Radiation - Sun exposure	Use appropriate insect repellants, sunscreen and wear long sleeve clothing. Clear work are of vegetation prior to work activities (See Site Vegetation Clearing JSA).	

3	Bailing Wells	1	Motion - Repetitive bailing motion	Slowly raise and lower bailer in and out of well. Use appropriate lifting techniques. Take breaks or task rotation if needed.	
		2	Environment, Gravity - Water spilling on the ground can cause muddy/slippery conditions	Be careful walking around wet/slippery surfaces. Use plastic sheeting around well to protect from spillage as appropriate.	
		3	Mechanical - Cuts can occur when preparing materials such as rope	No open fixed blades should ever be used. Instead use self-retracting blades. Wear leather gloves and cut away from the body.	
		4	Chemical. Motion - Purge liquid can splash onto ground, clothes or eyes	Pour water slowly into bucket or drum. Wear appropriate PPE and have spill cleanup kit ready if needed.	
		5	Biological - Insects, plants and animals. Radiation - Sun exposure.	Use appropriate insect repellants, sunscreen and wear long sleeve clothing. Clear work area of vegetation prior to work activities.	
4	Staging of well purge liquid	1	Motion - Muscle strains can occur when moving purge water/drums.	If using buckets do not fill buckets to top. Fill half way and use more buckets if necessary. Always keep lid on buckets when traveling or moving to another location. Have cart or dolly to move drums if necessary.	

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	long sleeve shirt/pants		Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	chemical resistant gloves (specify type)	nitrile	Required
	work gloves (specify type)	leather	Required
Head Protection	hard hat		Required
Miscellaneous PPE	traffic vest--Class II or III		Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Decontamination	Decon supplies (specify type)		Required
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
Personal	eye wash (specify type)		Required
	insect repellent		Recommended
	sunscreen		Recommended
Traffic Control	traffic cones		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Rogers, Edward F Quality Reviewer NA 12/24/2013	nice approach

Job Safety Analysis

General

JSA ID	44	**Status**	(3) Completed
Job Name	Environment-Drilling, Soil Sampling, Well Installation	**Created Date**	10/21/2020
Task Description	Drilling, Soil Sampling	**Completed Date**	
Template	True	**Auto Closed**	False

Client / Project

Client	BMS
Project Number	30049894
Project Name	Building 55 Area PDI
Account Leader	Gary Wroblewski
Project Manager	Bill McCune

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Brian McCann	10/15/2020	10/15/2020	John Grogg	☑
Developer	Dave Cornell	10/15/2020	10/15/2020	Scott Powlin	☑
HASP Reviewer	Dan Zuck	10/21/2020	10/21/2020	Bill McCune	☑
Quality Reviewer	Bill McCune	10/21/2020	10/21/2020	Heather VanDewalker	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Set up necessary traffic and public access controls	1	Struck by vehicle due to improper traffic controls	Use a buddy system for placing site control cones and/or signage. Position vehicle so that you are protected from moving traffic. Wear Class II traffic vest	
2	Utility Clearance	1	Potential to encounter underground or above ground utilities while drilling.	Complete utility clearance in accordance with the ARCADIS Utility Clearance H&S Standard.	Arcadis H&S Standard ARCHSFS019
3	General drill rig operation	1	Excessive noise is generated by rig operation.	When the engine is used at high RPMs or soil samples are being collected, use hearing protection.	
		2	During drill rig operation, surfaces will become hot and cause burns if touched, and COCs in the soils more readily vaporize generating airborne contaminates.	Due to friction and lack of a drilling fluid, heat will be produced during this method. Mainly drill augers. Be careful handling split spoons. Wear proper work gloves. When soils and parts become heated, the COC could volatilize. Air monitoring should always be performed in accordance with the HASP.	
		3	Moving parts of the drilling rig can pull you in causing injury. Pinch points on the rig and auger connections can cause pinching or crushing of body parts.	Stay at least 5 feet away from moving parts of the drill rig. Know where the kill switch is, and have the drillers test it to verify that it is working. Do not wear loose clothing and tie long hair back. Avoid wearing jewelry while drilling. Cone off the work area to keep general public away from the drilling rig.	
		4	Dust and debris can cause eye injury and soil cuttings and/or water could contain COCs.	Wear safety glasses and stay as far away from actual drilling operation as practicable. Wear appropriate gloves to protect from COCs.	
		5	Drilling equipment laying on the ground (i.e. augers, split spoons, decon equipment, coolers, etc.), create a tripping hazard. Water from decon buckets generate mud and cause a slipping hazard.	Keep equipment and trash picked up, and store away from the primary work area.	
		6	The raised derrick can strike overhead utilities, tree limbs or other elevated items	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Clearance H&S Standard for guidance.	

4	Mud rotary drilling	1	The raised derrick can strike overhead utilities, tree limbs or other elevated items.	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Location H&S policy and procedure for guidance.	
		2	This technology uses fluid, which collects with sediments in large basin. Fluid can splash out and cause slipping/mud hazard. Liquid mixture can splash into your eyes.	Wear rubber boots if needed and keep clear of muddy/wet area as much as practicable. If area becomes excessively muddy, consider mud spikes or covering the area with a material that improves traction. Wear safety glasses.	
5	Hollow stem auger drilling	1	All hazards in step 3 apply. Additionally, the raised derrick can strike overhead utilities, tree limbs or other elevated items	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Location H&S policy and procedure for guidance.	
		2	Hands or fingers can get caught and crushed if trying to clean by hand or with tools while the auger is still turning.	Auger should always be stopped, and clutch disengaged prior to cleaning.	
6	Air Rotary Drilling	1	This drilling method works with high air pressure and can generate flying debris that can strike your body or get in your eyes.	When the drill rig is being driven into media, it will produce flying debris. The flaps behind the drill rig should stay closed whenever possible to reduce the risk of flying debris. Safety glasses and hard hat should always be worn when the drill rig is operating. When penetrating asphalt, protect surrounding cars that may be present to avoid damage to pain or windshields.	
		2	The raise derrick can strike overhead utilities, tree limbs or other elevated items.	Never move this rig with the derrick up. Ensure there is proper clearance to raise the derrick and that you are far enough away from overhead power lines. See the Utility clearance H&S Standard for guidance.	
		3	When drilling through bedrock prior to groundwater, dust can be produced from pulverization. Inhalation of dusts/powder can occur.	Supplemental water should be used to manage dust and/or dust masks should be used if necessary.	
7	Reverse rotary drilling	1	This method will use fresh water to pump out drill cuttings through the center of the casing. Water/sediment mixture is generated and could cause contact with impacted soils or groundwater.	Ensure the pit construction can hold the number of cuttings that are anticipated. Air monitoring should also be used of pit area.	
		2	Fire hydrants are often used for water source. Hydrants deliver water at high pressure. Pressurized water can cause flying parts/debris and excessive slipping hazards.	Water usage from fire hydrants should be cleared with local municipalities prior to use. Only persons that know how to use the hydrant should be performing this task. Ensure all connections are tight, and hose line is not run over to cut by traffic. Any leaks from the hydrant should be reported immediately.	
		3	Settling pit construction can cause tripping hazard from excavated soils, and plastic sheeting can cause slipping.	Cone off the area to keep the general public/visitors away from the settling pit. Ensure proper sloping of excavation.	
		4	The raised derrick can strike overhead utilities, tree limbs or other elevated items.	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Location H&S policy and procedure for guidance.	
8	Roto-sonic drilling	1	Fire hydrants are often used for water source. Hydrants deliver water at high pressure. Pressurized water can cause flying parts/debris and excessive slipping hazards.	Water usage from fire hydrants should be cleared with local municipalities prior to use. Only persons that know how to use the hydrant should be performing this task. Ensure all connections are tight, and hose line is not run over to cut by traffic. Any leaks from the hydrant should be reported immediately.	
		2	This method requires a lot of clearance. The drill head can turn 90 degrees to attach to the next drill flight or casing. This usually requires a large support truck to park directly behind the rig. As the drill head raises the new casing flight is angled down at the same time until it can be turned completely vertical.	Ensure enough overhead clearance.	

		3	Heavy lifting of cores can cause muscle strain.	Always use 2 people to move core containers. Use caution moving core samples to layout area. Plan layout area to ensure adequate aisle space between core runs for logging. Keep back straight and use job rotation.	
		4	The Roto-sonic drill head can move very quickly up and down while working on a borehole. Moving parts can strike someone or catch body parts.	The operator and helper must communicate and stay clear of the path of the drill head. The drill utilizes two large hydraulic clamps to continuously hold casings while load/unloading previous casings. Do not wear loose clothing.	
9	Direct push drilling	1	The drill rods will be handled by workers most of the time rather than the rig doing it, therefore pinch points can cause lacerations and crushing of fingers/body parts.	Keep a minimum of 5 feet away from drill rig operation and moving parts.	
		2	The direct push rigs are usually meant to fit in spaces where larger rig cannot. Tight spaces can pin workers.	Do not put yourself between the rig and a fixed object. Use Spotters or a tape measure to ensure clearances in tight areas. Pre-plan equipment movement from one location to the next.	
		3	Some direct push equipment is controlled by wireless devices. These controls can fail, and equipment can strike workers or cause damage to property.	The drill rig should be used in a large open area to test wireless controls prior to moving to boring locations. The operator of the rig will test the kill switch with wireless remote prior to use. Operator will stay in range of rig while moving so that wireless signal will not be too weak and cause errors to the controls.	
		4	Sampling sleeves must be cut to obtain access to soil. Cutting can cause lacerations.	It is preferable to let the driller cut the sleeves open. Many drillers have holders for the sleeve to allow for stability when cutting. If you cut the sleeves, use a hook blade, change blade regularly, and cut away from the body.	
		5	Soil cores may contain contaminated media.	Wear nitrile gloves and safety glasses for protection from contaminated media when logging soil borings.	
10	Rock coring	1	Flying debris can hit workers or cause debris to get in eyes.	Rock chips or overburden may become airborne from drilling method. Wear safety glasses and hard hat and remain at a safe distance from back of drill rig.	
		2	Heavy lifting of cores can cause muscle strain.	Always use 2 people to move core containers. Use caution moving core samples to layout area. Plan layout area to ensure adequate aisle space between core runs for logging. Keep back straight and use job rotation.	
11	Sample collection and processing	1	Injuries can result from pinch points on sampling equipment, and from breakage of sample containers.	Care should be taken when opening sampling equipment. Look at empty containers before picking them up, and do not over-tighten container caps. Use dividers to store containers in the cooler so they do not break.	Sample Cooler Handling JSA
		2	Lifting heavy coolers can cause back injuries.	Use two people to move heavy coolers. Use proper lifting techniques.	
12	Monitoring well installation	1	Same hazards as in Step 3 with general drill rig operation	See step 3	
		2	Monitoring well construction materials can clutter the work area causing tripping hazards.	Well construction materials should be picked up during the well installation process.	
		3	Heavy lifting can cause muscle strains and cutting open bags can cause lacerations.	Well construction materials are usually 50 lbs. or greater. Team lift or use drill rig to hoist bags. Always use work gloves while cutting open bags.	
		4	Well pack material (i.e. sand, grout, bentonite) can become airborne and get in your eyes.	Wear safety glasses for protection from airborne sand and dust.	
		5	Cutting the top of the well to size can cause jagged/sharp edges on the top of the well casing.	Wear gloves when working with the top of the well casing and file any sharp jagged edges that resulted from cutting to size.	

13	Soil cutting and purge water management	1	Moving full drums can cause back injury, or pinching/crushing injury.	Preferably have the drilling contractor move full drums with their equipment. If this is not practicable, use lift assist devices such as drum dollies, lift gates, etc. Employ proper lifting techniques and perform TRACK to identify pinch/crush points. Wear leather work gloves and clear all walking and work areas of debris prior to moving a drum.	Drum Handling JSA

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	chemical resistant gloves (specify type)	Nitrile	Required
	work gloves (specify type)	leather	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs		Required
Miscellaneous PPE	traffic vest--Class II or III		Required
Respiratory Protection	dust mask		Recommended

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Decontamination	Decon supplies (specify type)	Driller to provide and manage	Recommended
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
Personal	eye wash (specify type)	bottle	Required
	water/fluid replacement		Recommended
Traffic Control	traffic cones		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Dan Zuck HASP Reviewer Approve 10/21/2020	
Employee: **Role** **Review Type** **Completed Date**	Bill McCune Quality Reviewer NA 10/21/2020	Comprehensive JSA template addresses the work activities to be performed.

Job Safety Analysis

General

JSA ID	7983	**Status**	(3) Completed
Job Name	Environment-Drum sampling/handling	**Created Date**	7/26/2012
Task Description	Drum Handling, Sampling and Transfer of Drum Contents	**Completed Date**	07/26/2012
Template	True	**Auto Closed**	False

Client / Project	
Client	Arcadis AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Betancourt, Ketzia	8/16/2012	7/26/2012	Hubbard, Lauren M	☐
HASP Reviewer	Hubbard, Lauren M	8/9/2012	7/26/2012	Tremblay, Tony	☑
Quality Reviewer	Hubbard, Lauren M	7/27/2012	7/27/2012	Tremblay, Tony	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Inspect Drums for signs of Bulging, Leaking, Crystals, Temperature, and Odor	1	Exposure to chemicals stored in drum or container.	Read drum labels for information about contents. Review all relevant MSDSs about chemical contents. If labels are not attached, call PM or Local H&S Representative.	None
		2	Contents of the drum can cause fire/explosion hazard.	Use air monitoring meters to screen drums. % LEL and VOCs (PPM). If either of the values are above the action levels described in the HASP or MSDS then Stop Work, move away from the area, and reassess the situation. Call PM and H&S staff for support.	
2	Remove lids or bungs from Drums	1	Hand Injuries can occur from sharp edges, pinch points, and from use of hand tools.	Wear appropriate work gloves. When removing ring from drum, fingers can get pinched between ring and drum. Keep fingers clear of this space. Select proper tool for task. If large amount of drums will be encountered, use a speed or drum wrench.	Employee H&S Field book, Section III Subpart II, page 104. Also Section III Subpart L, page 38.
		2	Rapid depressurization from empty or partially full drums can cause flying parts or volatile COCs releasing on staff.	Do not handle or open bulging drums (contact Corp H&S for assistance). Bleed any built up pressure by carefully loosening bung prior to removing ring. Keep face and arms away from bung opening when loosening. Slightly lift lid, insert end of air monitoring device to monitor air inside drum.	
		3	Use of mechanical tools to remove bolts from drum lids causes excessive noise.	Wear hearing protection.	
		4	Splashing can occur if filling drum, or collecting samples.	Wear eye and face protection. Pour liquids into drum slowly to minimize splashing.	
		5	When working with COCs that have fire/explosive properties, sparking or heat could cause fire/explosion.	Use brass or non-Spark Hand Tools if such a hazard exists or is suspected.	
3	Sample Contents from Drums	1	Exposure to COCs can occur by contacting impacted contents.	Select proper dermal protection for task, at a minimum nitrile gloves should be worn. Wear appropriate eye face and body protection as outlined in the HASP.	
		2	Staff can be exposed to chemical vapors/fumes when sampling.	Conduct air monitoring as outlined in the HASP, and if required, select appropriate respiratory protection for the task.	

		3	Sharp edges and broken sample containers can cause lacerations.	Discard any broken sample ware or glass properly. Do not over tighten sample containers.	
		4	Chemical burns or skin irritation can occur from contact with sample preservatives.	Wear chemical protective gloves when collecting samples, or when handling damaged sample containers.	
4	Replace drum lids	1	Hand Injuries can occur from sharp edges, pinch points, and from use of hand tools.	see step 2 above	
5	Moving and Storing Drums	1	Drum storage areas can be accessed by the general public, or may not be secure.	Calculate how many drums will be stored in new location. Ensure that drums are not easily accessed by the general public. Do not store such that drums impede pedestrian or vehicular traffic.	
		2	Muscle strain can occur when lifting/pulling/pushing drums.	Drums that are full can weigh as much as 800 lbs. Use a lift assist device whenever possible, and use a team lift approach. When moving soil drum generated by drilling, have drillers use their equipment to move the drums. Using dolly, slightly lift drum away from dolly to install forks under drum. Slowly let drum come back down and rest on dolly. Using hook on top of dolly, ensure it latches on top of drum bung.	
		3	Body parts can be pinched between lift device, or drum and the ground.	Be aware of hand and foot placement during drum staging. Do not hurry through task.	
		4	When moving, the drum can tip or the dolly could become unstable from uneven ground surface.	Plan travel route with drum prior to moving. With drum secure on dolly, have one employee pull back on dolly, and other employee slowly push back on drum toward dolly. Have second worker act as spotter for traffic, pedestrians, and any trip hazards along the way.	

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	chemical protective suit (specify type)		Required
Eye Protection	face shield		Required
	safety goggles		Required
Hand Protection	chemical resistant gloves (specify type)	Nitrile	Required
	work gloves (specify type)		Required
Hearing Protection	ear plugs		Required

Supplies

Type	Supply	Description	Required
Miscellaneous	Other	dolly	Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Hubbard, Lauren M HASP Reviewer Approve 7/26/2012	
Employee: **Role** **Review Type** **Completed Date**	Hubbard, Lauren M Quality Reviewer NA 7/27/2012	Reviewed by Corporate H&S Department

Job Safety Analysis

General

JSA ID	45	**Status**	(3) Completed
Job Name	Environment-Groundwater Sampling and Free Product Recovery	**Created Date**	10/21/2020
Task Description	Groundwater Sampling	**Completed Date**	
Template	True	**Auto Closed**	False

Client / Project

Client	BMS
Project Number	30049894
Project Name	Building 55 Area PDI
PIC	Gary Wroblewski
Project Manager	Bill McCune

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Dave Cornell	10/15/2020	10/15/2020	Scott Powlin	☑
HASP Reviewer	Dan Zuck	10/21/2020	10/21/2020	Bill McCune	☑
Site Specific Updates	Bill McCune	10/21/2020	10/21/2020	Heather VanDewalker	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Stage at pre-determined sampling location and set up work zone and sampling equipment	1	Personnel could be hit by vehicular traffic	Set up cones and establish work area per the site Traffic Safety Plan. Position vehicle so that field crew is protected from site traffic. Unload as close to work area as safely possible.	See Site TSP
		2	Vehicles parked too close to stationary objects may strike them when driving from location.	Park vehicle so first movement is forward. Park in a location that will be free of stationary objects, such as bollards, monitoring wells, fence posts, etc. when the vehicle pulls forward. Avoid backing! At work locations where space is not restricted, leave a minimum of 5 feet between the work vehicle and the nearest stationary object.	
		3	Sampling equipment, tools and monitoring well covers can cause tripping hazard	Keep equipment picked up and use TRACK to assess changes.	
2	Open wells to equilibrate and gauge wells	1	When squatting, personnel can be difficult to see by vehicular traffic.	Wear class II traffic vest if wells are located proximal to vehicular traffic. Use tall cones and the buddy system if practicable.	
		2	Pinch points on well vault can pinch or lacerate fingers	Use correct tools to open well vault/cap. Wear leather gloves when removing well vault lids, and chemical protective gloves while gauging. Wear proper PPE including safety boots, knee pads and safety glasses.	
		3	Lifting sampling equipment can cause muscle strain	Unload as close to work area as safely possible; use proper lifting and reaching techniques and body positioning; don't carry more than you can handle, and get help moving heavy or awkward objects.	
		4	Pressure can build up inside well causing cap to release under pressure	Keep head away from well cap when removing. If pressure relief valves are on well use prior to opening well	
3	Begin Purging Well and Collecting Parameter Measurements	1	Electrical shock can occur when connecting/disconnecting pump from the battery.	Make sure equipment is turned off when connecting/disconnecting. Wear leather gloves. Use GFCIs when using powered tools and pumps. Do not use in the rain or run electrical cords through wet areas.	
		2	Purge water can spill or leak from equipment	Stop purging activities immediately, stop leakage and block any drainage grate with absorbent pads. Call PM to notify them of any reportable spill.	

		3	Water spilling on the ground can cause muddy/slippery conditions	Be careful walking in work area when using plastic around well to protect from spillage	
		4	Lacerations can occur when cutting materials such as plastic tubing	When cutting tubing, use tubing cutter. No open fixed blades should ever be used. When possible wear work gloves, leather type.	
		5	Purge water can splash into eyes	Pour water slowly into buckets/drums to minimize splashing. Wear safety glasses.	
4	Collect GW or Free Product Sample	1	Working with bailer rope can cause rope burns on hands.	Slowly raise and lower the rope or string for the bailer. Wear appropriate gloves for the task.	
		2	Sample containers could break or leak preservative	Discard any broken sample ware or glass properly. Do not overtighten sample containers. Wear chemical protective gloves.	
5	Recovery of Free Product from well	1	Exposure to free product	Additional chemical protection may be necessary based on the type of product. Additionally, safety goggles, a face shield, or respiratory protection may be required. Verify in the HASP.	
6	Staging of Well Purge water and/or Free Product	1	Muscle strains can occur when moving purge water or drums	If using buckets, do not fill buckets up to the top. Always keep lid on buckets when traveling or moving them to another location. Only half fill buckets so when dumping the buckets weigh less. See drum handling JSA for movement of drums.	Drum handling JSA

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	long sleeve shirt/pants		Recommended
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	chemical resistant gloves (specify type)	Nitrile	Required
	work gloves (specify type)	leather	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs		Recommended
Miscellaneous PPE	other	Knee pads	Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Decontamination	Decon supplies (specify type)	Alconox, DI water, spray bottle	Required
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
	flashlight		Required
Personal	eye wash (specify type)	bottle	Required
	insect repellent		Recommended
	sunscreen		Recommended
Traffic Control	barricades		Recommended
	traffic cones		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Dan Zuck HASP Reviewer Approve 10/21/2020	
Employee: **Role** **Review Type** **Completed Date**	Bill McCune Site Specific Updates 10/21/2020	Updated the HASP template to be specific to the site.

Job Safety Analysis

General

JSA ID	17522	**Status**	(3) Completed
Job Name	Environment-Air Monitoring	**Created Date**	5/4/2020
Task Description	Indoor Air Sampling	**Completed Date**	05/05/2020
Template	False	**Auto Closed**	False

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Driving to and from sampling locations.	1	Striking or being struck by another object or vehicle	Follow the 5 Keys of Smith System Driving	FHSH Section III-U, Motor Vehicle Safety HS Standard ARCHSGE004, Driving JSA #15
2	Approach site and communicate with occupant	1	Hostile or agitated occupants. Occupants may be potentially violent.	Use Stop Work Authority. Never approach a site alone; always use the buddy system. Always have a cell phone. Do not attempt to enter a site or communicate with its occupants, if you feel threatened in any way. Leave the property and call 911 if there is clear and present danger. Call PM after contacting the appropriate authorities. Do not attempt to interact with the occupants but leave the area and wait for authorities. Communicate regularly with PM or APM on progress.	FHSB Section III-H, Stop Work Authority HS Standard ARCHSGE009
3	Sample Canister - sampling prep, collection and shipping	1	Heavy Lifting	Use a dolly, when necessary, to move canisters to and from your vehicle. Practice good lifting techniques and keep your back straight. Avoid twisting or awkward movements/positions. Remove canisters from the box and transport individually. If the box or other equipment are too heavy, request assistance in lifting.	FHSB Section III-EE
		2	Cuts or lacerations from opening the box of canisters	Use appropriate cutting tools such as safety knives and cut away from your body when opening the box.	
		3	Pinch points	Use proper tools for adjusting canister valves. Wear gloves when necessary	
		4	Limited visibility - evening hours	Have a flashlight available or a head lamp for hands free light. Try and schedule work during daylight hours and end sampling events early enough to allow for clean up before dusk.	
4	Sub-Slab soil vapor sampling	1	Slips, trips, falls. Pinch points. Eye injury from debris. Injury from lifting and carrying equipment.	Wear work gloves when handling equipment/materials. Practice good housekeeping. Unload equipment as close to work area as possible. Keep equipment and supplies organized. Wear work gloves when handling equipment/materials. Use correct size wrenches when assembling sampling train. Use safety goggles. Practice good lifting techniques and keep your back straight. Avoid twisting or awkward movements/positions. Use two people to lift items heavier than 50 pounds.	FHSB Section III-AA,CC,L,Electrical Safety HSS, Hearing Conservation HSS
		2	Electrical shock from the improper use of power tools (electric hammer drill)	Wear appropriate gloves. Do not remove any safety guards from power tools. Inspect power cords for damage/wear. Be aware of potential for hidden electric sources. Make sure your power source is rated appropriately for the equipment being used. Always unplug equipment before performing any repairs.	
		3	Lacerations from cutting of sample tubing	Use appropriate cutting device and wear gloves when handling blades. Collect purged soil vapor in a Tedlar bag. Discharge purged soil vapor outside building.	
		4	Exposure to constituents in soil vapor	Collect purged soil vapor in a Tedlar bag. Discharge purged soil vapor outside building. Perform air monitoring to monitor exposure.	
		5	Excessive noise generated by hammer drill operation	During drilling operations, hearing protection should be used.	

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Eye Protection	face shield		Required
	safety glasses		Required
	safety goggles	When using electric hammer drill	Required
Foot Protection	boots		Required
	steel-toe boots	w/ steel shank	Required
Hand Protection	chemical resistant gloves (specify type)	Nitrile	Required
	work gloves (specify type)	Leather	Required
Head Protection	hard hat	If wearing does not cause hazard	Required
Hearing Protection	ear plugs		Required
Miscellaneous PPE	other	Fall protection when working at heights	Required
Respiratory Protection	full face respirator	When sampling friable asbestos	Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
	flashlight		Recommended
Personal	eye wash (specify type)		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Lawson, Charles HASP Reviewer Approve 5/5/2020	
Employee: **Role** **Review Type** **Completed Date**	Wadhawan, Amar Quality Reviewer NA 5/29/2020	Good and thoughtful JSA. Contacting property owner and securing access before arriving to sample will certainly mitigate any surprises or hostile interactions.

Job Safety Analysis

General

JSA ID	14819	**Status**	(2) Review
Job Name	Environment-Other	**Created Date**	3/6/2017
Task Description	Segregate and remove impacted soil from an roll-off mostly filled with clean soil. The bed of the roll-off is less than 4 feet deep and has a door that can be used for unrestricted entry and exit.	**Completed Date**	
Template	False	**Auto Closed**	False

Client / Project

Client	BRISTOL-MYERS COMPANY
Project Number	B00873630024
Project Name	PHASE 2 - WELL INSTALLATION A
PIC	WROBLEWSKI, GARY
Project Manager	WRIGHT, DAVID

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Healy, Lawrence C	3/28/2017	3/7/2017	Brien, Jason D	☑
HASP Reviewer	Zuck, Daniel A.	3/21/2017		McCune, William T	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Inspect roll-off and contained material.	1	Exposure to chemicals stored in the roll-off	Read any labels for information about contents. Review relevant SDSs and available laboratory analytical results for container contents.	Arcadis H&S Fieldbook Section III Subsection AJ.
2	Remove soil from roll-off by reaching over the top of the container from the outside and using shovels.	1	Slips, trips, and falls	If possible, stand on a stable elevated surface less than 4 feet above the ground when shoveling. Remove any loose objects from standing surface that might cause trips or roll when stood upon. Wear thick-soled work boots with good tread.	Arcadis H&S Fieldbook Section III Subsections AF and AJ.
		2	Repetitive motion causing back strain	If possible, stand on a stable elevated surface less than 4 feet above the ground. Use legs to lift. Do not lift up more material than you are able with the shovel. Switch grips and stretch throughout activity. If possible, hold shovel with hands far apart and one hand near tip of shovel to reduce torque weight.	
		3	Loose, falling, or flying debris from lifting loaded shovels above a surface.	Wear safety googles and a hard hat. It is recommended to wear a face mask. Do not lift the loaded shovel directly over anyone's head. Make sure no one except the person using the shovel is standing within the range of movement of the loaded shovel.	
3	Enter and exit roll-off container as needed to complete work activities. The roll-off includes ladders on the inside and outside.	1	Fall from heights	Review Arcadis policy for climbing ladders. Inspect ladder's integrity before use. Maintain three points of contact when using ladder. Do not carry equipment when using ladder. Do not use the top of the ladder as a step. Make sure the ladder is dry and any material that might cause slips is removed from the ladder.	Arcadis H&S Fieldbook Section III Subsection AK
		2	Falling equipment from ladder.	Do not carry equipment on ladder. Either have a coworker pass you the needed equipment after ladder use or place the needed equipment at a location accessible after climbing the ladder.	
4	Work within roll-off container.	1	Potential exposure to impacted material and COCs.	Select proper dermal protection for task, at a minimum viton-coated butyl rubber gloves and full body Tyvex should be worn. Wear appropriate eye and face protection. Review available MSDSs and laboratory analytical results of material within container.	Arcadis H&S Fieldbook Section III Subsection S

4	Work within roll-off container.	2	Staff can be exposed to chemical vapors/fumes when sampling.	Conduct air monitoring as outlined in the HASP, and if required, select appropriate respiratory protection for the task.	
		3	Difficulty leaving the container.	Ensure that a unrestricted means for exit is maintained. Use buddy system to spot worker inside the container.	
		4	Slips, trips, and falls within container. Soil within the container does not provide a stable walking surface.	Wear appropriate footwear with good tread. Walk carefully and avoid stepping on cobbles or stones that could roll or slip underneath a foot. Walk in center of container to limit the chance of slipping and falling out of roll-off. If needed hold onto side of container for extra support.	

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	chemical protective suit (specify type)	Full Body Tyvex.	Required
Eye Protection	faceshield		Recommended
	safety glasses	ANSI Z97.1	Required
Foot Protection	boots	Steel-Toed Boots	Required
	steel-toe boots		Required
Hand Protection	chemical resistant gloves (specify type)	Viton-coated butyl rubber gloves	Required
	work gloves (specify type)	Leather	Required
Head Protection	hard hat		Required
Miscellaneous PPE	traffic vest--Class II or III		Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	first aid kit	located in Arcadis field vehicle	Required
Personal	eye wash (specify type)	bottle, located in Arcadis field vehicle	Required
Traffic Control	traffic cones		Recommended

Job Safety Analysis

General

JSA ID	4079	**Status**	(3) Completed
Job Name	General Industry-Site Inspection/Walkover	**Created Date**	10/15/2020
Task Description	Site Inspection	**Completed Date**	
Template	True	**Auto Closed**	False

Client / Project

Client	BMS
Project Number	30049894
Project Name	Building 55 Area PDI
PIC	Gary Wroblewski
Project Manager	Bill McCune

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Dave Cornell	10/15/2020	10/15/2020	Scott Powlin	☑
HASP Reviewer	Dan Zuck	10/21/2020	10/21/2020	Bill McCune	☑
Quality Reviewer	Bill McCune	10/21/2020	10/21/2020	Heather VanDewalker	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Undeveloped Site Walk (Winter Conditions)	1	Slippery/icy conditions	Use caution and proper footwear with traction	
		2	Eye/face injury	Use caution when walking through trees and brush. Wear proper eye protection to avoid eye injury	
		3	Hypothermia/frostbite	Assess weather conditions and wear proper clothing to avoid hypothermia/frostbite and freezing	
		4	Falling ice/snow	Assess the site for falling ice/snow from trees/powerlines. Use caution when walking around trees and powerlines. Wear hard hat	
		5	Stray animals	Make lots of noise while walking through the site. Carry repellent in the event of encountering stray animals. If a dangerous or aggravated animal is spotted, leave the area, return to your vehicle and contact animal control.	
		6	Vehicular traffic	Asses the site and the surrounding area for vehicle traffic. Use caution when walking near busy roadways. Wear type II or III traffic vest.	
2	Undeveloped Site Walk (Summer Conditions)	1	Slips/trips/falls	Use caution when walking on un-even surfaces. Use proper footwear with traction	
		2	Eye injury	Use caution when walking through areas of trees and brush. Wear proper eye protection to avoid eye injury from tree limbs	
		3	Dehydration	Drink plenty of water and avoid long periods of direct sun exposure	
		4	Sunburn	Wear sunscreen. Avoid long periods of direct sun exposure. Work in the shade if possible.	
		5	Vehicular traffic	Assess the site and the surrounding area for vehicular traffic. Use caution when walking near busy roadways. Wear type II or III traffic vest.	
		6	Stray animals, ticks, bugs	Make lots of noise when traveling through the site and carry repellent spray. If a dangerous or aggravated animal is spotted, leave the area and return to your vehicle and contact animal control. Wear long pants/long sleeve shirt and use insect repellent as necessary	

PPE	Personal Protective Equipment		
Type	**Personal Protective Equipment**	**Description**	**Required**
Dermal Protection	long sleeve shirt/pants		Required
Foot Protection	steel-toe boots		Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	first aid kit		Required
Personal	eye wash (specify type)		Required
	insect repellent		Recommended
	sunscreen		Recommended

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Dan Zuck HASP Reviewer Revise 10/21/2020	Please refer to JLA 1602 and use the exterior site walk information as a template for this JLA. Thanks Ahren
Employee: **Role** **Review Type** **Completed Date**	Bill McCune HASP Update Approve 10/21/2020	Updated for current task.

Job Safety Analysis

General

JSA ID	38	**Status**	(3) Completed
Job Name	General Industry-Surveying - Land	**Created Date**	10/29/2020
Task Description	Land Surveying	**Completed Date**	10/29/2020
Template	True	**Auto Closed**	False

Client / Project

Client	BMS
Project Number	30049894
Project Name	Building 55 Area PDI
PIC	Gary Wroblewski
Project Manager	Bill McCune

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Coppola, Mija A	9/26/2009	2/2/2009	Ebert, Joachim	☐
HASP Revision	William McCune	10/29/2020	10/29/2020	Heather VanDewalker	☐
HASP Reviewer	Dan Zuck	10/29/2020	10/29/2020	William McCune	☐

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Site reconnaissance and walk-around	1	Slips/trips/falls can occur from walking on uneven ground surface.	Survey the site upon arrival. Note any site conditions that may pose a potential hazard.	JSA-Roadway Work ARCHSFS017
		2	Site workers or equipment can be struck by site vehicular traffic	Wear Class II traffic vest and cone off the work area. Follow the JSA and Field H&S Handbook for roadway work.	
		3	Slip / Trip / Fall	Slope >30° - Avoid walking down / up slope, use alternate route. Use an offset adapter that attaches to a survey rod to reach location. Use fall protection (Personal Fall Arrest) if accessing slope. Stop Work and contact Corporate H&S if controls are not adequate. Slope <30° - Ensure footwear has adequate traction, use over boot traction when muddy / wet. Use walking stick or trekking pole.	
		4	Exposure to ticks.	Assess locations for possible tick habitat. When possible, walk over thin, low grasses, dirt or rock paths. Avoid tall grasses, weeds and beds of fallen leaves (likely nest areas). Wear permethrin spray, heavily applied, on clothing (where permitted) and DEET (30% or higher) on exposed skin. Wear light colored clothing to make ticks more visible. Check for ticks on clothing and skin frequently. Tape pant legs to boots if working in potential tick habitat for extended periods. In areas with very high potential for exposure or known infestations, wear disposable coveralls.	
		5	Contact with poison ivy, poison oak or sumac may result in severe skin irritation.	Learn to identify how urushiol-containing plants appear during all seasons. Avoid contact with skin or clothing. Give plants a wide berth as younger plants in the area may be more difficult to recognize and the vines extending from recognized areas also contain urushiol. Consider applying a barrier cream to exposed skin. In areas where the plants are prevalent or in cases where individuals have known allergic responses to urushiol (i.e., poison ivy), wear chemically protective disposable coveralls.	

2	Deployment and retrieval of traffic control devices during roadway work	1	Stuck by vehicles	Face traffic and use spotter if not facing traffic, stay off the travelled roadway to extent practical, wear Class II (minimum) traffic vest. Familiarize yourself with work zone control layout prior to deploying devices.	
		2	Slips trips and falls on uneven road or land surfaces	Do not carry objects that obscure visibility of ground surface when walking, wear footgear with ankle support and good tread, use buddy system when carrying large bulky objects.	
		3	Lifting heavy or bulky signage or traffic channeling device	Brake down to manageable size. Do not overextend to grab cones from the interior of the project vehicle. Use proper lifting techniques, maintain good vehicle housekeeping to easily retrieve control devices. Use buddy system to move heavy objects like barrels.	
		4	Pinch points to hands on folding components of sign stands	Wear leather gloves or other suitable glove. Watch for hazard and avoid placing hands in pinch areas. Do not hurry through setup/take down.	
3	Removal of manhole covers	1	Pinch points and scrape hazards when removing MH cover.	Do not place fingers under lid during removal. Use shovels, pry bars, etc. to place under lid edge to lift. Wear sturdy work glove. Wear steel toed boot. Do not purposely drop lids.	
		2	Back/neck/arm/shoulder strains and hand blisters could occur from over lifting, or not lifting properly.	Use proper lifting techniques, keep back straight, lift with legs, use “J” Hook or pry bar, Buddy System required	
4	Equipment set-up, calibration and survey of target area	1	Slips/trips/falls can occur from walking on uneven ground surface.	Watch for uneven ground, debris, and trip hazards. If possible clear area of trip hazards. Wear gloves and heavy denim work pants to avoid cuts when working in heavy brush/briers. Use buddy system to spot for uneven ground while surveying.	
5	Placement of stakes	1	Hands/fingers/arms can get struck by hammer/mallet. Splinters and lacerations can occur if stake splinters during hammering.	Wear leather work gloves and safety glasses when placing stakes.	
6	Placement of monuments	1	Back strain from digging holes or mixing concrete	Use proper shoveling techniques and keep back straight. Use the right tool for the job.	Refer to Concrete work JSA
		2	Exposure to concrete can cause skin irritation or illness	Wear impermeable glove during mixing and concrete placement, promptly wash exposed skin. Do not use bare hands to mix, place, or finish concrete.	
		3	Inhalation of concrete dust during mixing	Keep face away from concrete when poured out of bag, promptly wet concrete to be mixed.	

PPE	**Personal Protective Equipment**		
Type	**Personal Protective Equipment**	**Description**	**Required**
Dermal Protection	long sleeve shirt/pants		Recommended
Eye Protection	safety glasses		Required
Foot Protection	boots	reinforced toe boots	Required
	rubber boots		Recommended
Hand Protection	work gloves (specify type)	Leather	Required
Head Protection	hard hat		Recommended
Miscellaneous PPE	other	snake chaps	Recommended
	traffic vest--Class II or III	orange during hunting season	Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
	Other	snake chaps depending on work location	Recommended
Personal	insect repellent		Required
	sunscreen		Required
	water/fluid replacement		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Dan Zuck HASP Reviewer Approve 10/29/2020	

Job Safety Analysis

General

JSA ID	11873	**Status**	(3) Completed
Job Name	Environment-Geophysical Survey	**Created Date**	10/27/2014
Task Description	Utility Clearance Activity	**Completed Date**	11/24/2014
Template	False	**Auto Closed**	True

Client / Project

Client	
Project Number	
Project Name	
PIC	
Project Manager	

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Hernandez Rivera, Gisela	11/17/2014	10/27/2014	Lebron, Rita N	☑
HASP Reviewer	Lebron, Rita N	11/10/2014		Calderon, Efrain	☑
Quality Reviewer	St. Germain, Daniel J.	11/25/2014	11/25/2014	Nelson, Denice K	☐
Reviewer	Gillette, Jacques F	11/10/2014	11/19/2014	Heavens, Mark	☐
Site Specific Updates	McCann, Brian T.			Merkle, Kurt J	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Coordinate Subsurface Utility Survey Activities	1	Traffic hazards, subsurface/overhead utilities, property damages	• Complete utility clearance checklist. • Review site locations and survey specifications. • Call and submit 811 Ticket • Collect information regarding utility location from on-site resources if available.	ARCHSFS019, Hand Auger JSA
2	Mobilization of location equipment to work area	1	Lifting hazards (heavy or bulky equipment)	• Use TRACK to plan lifts and routes to work location. See TSP • Use proper lifting techniques.	Traffic Safety Plan
		2	Awkward body positions and twisting	• Plan activity to avoid twisting of body or awkward body positions. • Use buddy system or job rotation to reduce exposure to conditions that cannot be avoided.	
		3	Trip and fall hazards from uneven ground or restricted view when carrying equipment	• Break loads down to manageable size that does not obstruct view of ground. • Plan route and use TRACK, wear footwear with good tread and ankle support. • Use buddy system for large, bulky or items weighing over 50lbs. when carrying.	
		4	Struck by onsite traffic	• See Traffic Safety Plan in HASP • Wear High Visibility work vest in accordance with HASP (Type 2 for day, Type 3 for night) • Utilize buddy system in high traffic areas.	Traffic Safety Plan
3	Set up survey area	1	Slip, trip and fall hazards from wet, uneven ground or over vegetation	• Identify and remove or minimize trip hazards. • Check for wet/slippery walking surfaces, equipment, excavations, among others. • Select the less dangerous and authorized access routes. • Do not walk across barricaded or non-authorized areas.	ARCHSFS019
		2	Crush hazard or contact stress to hands/fingers from inserting pins or stakes	• Wear leather gloves when inserting pins, flagging, or stakes into the ground. • Do not hurry task if hammering.	

		3	Struck by hazards by vehicles if working in traffic area	• Establish traffic control and wear a Class II traffic vest all the time. • Use vehicles to block work area when practical. • Only work in authorized areas.	
		4	Repetitive stress from repeated bending or squatting during grid construction	• Use job rotation when hazard exists, stretch before performing work activity. • Use paint device that allows employee to stand up while spraying.	
		5	Chemical exposure from using spray paint	• Stand up wind of paint spraying activities.	
		6	Struck by onsite traffic	• See Traffic Safety Plan in HASP • Wear High Visibility work vest in accordance with HASP (Type 2 for day, Type 3 for night) • Utilize buddy system in high traffic areas.	Traffic Safety Plan
4	Performing utility survey	1	Slips, trips and falls on wet, uneven or steep sloped surfaces	• Identify and remove or minimize trip hazards. • Check for wet/slippery walking surfaces, equipment, excavations, among others. • Select the less dangerous and authorized access routes. • Do not walk across barricaded or non-authorized areas.	ARCHSFS019
		2	Scrapes or cuts to hands, arms or legs from equipment or vegetation in area	• Clear the vegetation first if interrupted with the survey. • Wear leather or other suitable gloves when performing survey, wear long pants, wear heavy long sleeve shirt if arm hazard exists.	
		3	Ergonomic injury from improper or prolonged use of carried devices that are long or bulky	• Use job rotation to reduce potential for injury. • Implement proper lifting and body position practices. • Use buddy system for carrying heavy devices or equipment.	
		4	Struck by onsite traffic	• See Traffic Safety Plan in HASP • Wear High Visibility work vest in accordance with HASP (Type 2 for day, Type 3 for night) • Utilize buddy system in high traffic areas.	Traffic Safety Plan
		5	Injury from hand clearance to 5’ with hand auger	• See Hand Auger JSA • Utilize proper technique when using hand auger • Keep away from high traffic areas • Wear work gloves per HASP when using hand auger	Hand Auger JSA
5	Demobilization and clean up	1	Muscle strain from removing pins or stakes	• Use devices that maintain neutral body positions to remove pins when practical. • Do not bend at waist when removing.	
		2	Pinch hazards to fingers from equipment cases	• Keep away the fingers from "line of fire". • Be careful when handle equipment cases during open/close task. • Wear leather gloves.	
		3	Lifting hazards from demobilizing equipment from work area	• Use buddy system to lift heavy equipment. • Implement good lifting / carrying techniques and proper body positioning practices.	
		4	Slip, trip and falls carrying equipment that obstructs view or on wet or uneven surfaces	• Identify and remove or minimize trip hazards. • Check for wet/slippery walking surface, equipment, and excavations, among others. • Select the less dangerous and authorized access routes. • Do not walk across barricaded or non-authorized areas.	
		5	Struck by onsite traffic	• See Traffic Safety Plan in HASP • Wear High Visibility work vest in accordance with HASP (Type 2 for day, Type 3 for night) • Utilize buddy system in high traffic areas.	Traffic Safety Plan

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	long sleeve shirt/pants		Required
Eye Protection	safety glasses		Required
Foot Protection	Safety-toed boots		Required
Hand Protection	work gloves (specify type)	leather	Required
Head Protection	hard hat		Required
Miscellaneous PPE	traffic vest--Class II or III		Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	fire extinguisher	20# ABC	Required
	first aid kit	25-person	Required
Personal	eye wash (specify type)	Bottle	Required
	insect repellent		Recommended
	sunscreen		Recommended
	water/fluid replacement		Required
Traffic Control	traffic cones and tape	Per TSP	Required
Other	Hand Auger and Decon Supplies		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Gillette, Jacques F Reviewer Approve 11/19/2014	
Employee: **Role** **Review Type** **Completed Date**	St. Germain, Daniel J. Quality Reviewer NA 11/25/2014	Very detailed TIP. Good use of TRACK!

Job Safety Analysis			
General			
JSA ID	14971	**Status**	(3) Completed
Job Name	Environment-Drilling, Soil Sampling, Well Installation	**Created Date**	4/16/2017 Revised- 8/30/2019
Task Description	Installation of Soil Vapor Extraction Wells	**Completed Date**	04/18/2017
Template	False	**Auto Closed**	False

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Chest, Mark A	5/7/2017	4/16/2017	Hughes, Jason M	□
HASP Reviewer	Capell, Cindy M	4/30/2017	4/18/2017	Wilson, Janette D.	□

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Utility Clearance	1	Potential to encounter underground or above ground utilities while drilling.	Complete utility clearance in accordance with the ARCADIS Utility Clearance H&S Standard.	ARCADIS H&S Standard ARCHSFS019
2	General drill rig operation	1	Excessive noise is generated by rig operation.	When the engine is used at high RPMs or soil samples are being collected, use hearing protection.	
		2	During drill rig operation, surfaces will become hot and cause burns if touched, and COCs in the soils more readily vaporize generating airborne contaminates.	Due to friction and lack of a drilling fluid, heat will be produced during this method. Mainly drill augers. Be careful handling split spoons. Wear proper work gloves. When soils and parts become heated, the COC could volatilize. Air monitoring should always be performed in accordance with the HASP.	
		3	Moving parts of the drilling rig can pull you in causing injury. Pinch points on the rig and auger connections can cause pinching or crushing of body parts.	Stay at least 5 feet away from moving parts of the drill rig. Know where the kill switch is, and have the drillers test it to verify that it is working. Do not wear loose clothing and tie long hair back. Avoid wearing jewelry while drilling. Cone off the work area to keep general public away from the drilling rig.	
		4	Dust and debris can cause eye injury and soil cuttings and/or water could contain COCs.	Wear safety glasses and stay as far away from actual drilling operation as practicable. Wear appropriate gloves to protect from COCs.	
		5	Drilling equipment laying on the ground (i.e. augers, split spoons, decon equipment, coolers, etc.), create a tripping hazard. Water from decon buckets generate mud and cause a slipping hazard.	Keep equipment and trash picked up, and store away from the primary work area.	
		6	The raised derrick can strike overhead utilities, tree limbs or other elevated items	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Clearance H&S Standard for guidance.	
		7	Drilling in areas where high historic concentrations of methylene chloride have been encountered. Staff could potentially be exposed to high concentrations in the breathing zone.	Review SDS for methylene chloride and include symptoms of exposure during tailgate topic during drilling days. Air monitoring equipment shall be acquired in accordance with the HASP monitoring requirements and calibrated daily before work. Mechanical fans shall be deployed to the work areas and shall be run. An exclusion zone of 50' surrounding the work area shall be established, and personnel not associated with the drilling shall keep out and monitor for 3rd party traffic in the area. IF 3rd party traffic approaches, the work will be shut down. The breathing space shall be continuously monitored using a PID (with an 11.7eV bulb) in accordance with the HASP (Tab 7), and a MC specific Draeger tube (at 15 minute intervals) during the first hour of drilling. If background readings within that first hour do not reach the AL,	

				Drager tube frequency may be reduced to hourly. If action levels are exceeded with the PID, Draeger tubes will be used to monitor breathing space at 15 minute intervals. If the action level is reached (10ppm), work shall cease and the project team shall contact Corporate H&S to plan for Level B work. In the event that rain interferes with the PID readings, Draeger tubes will be used in lieu of the PID, and shall be drawn at 15 minute intervals.	
3	Hollow stem auger drilling	1	All hazards in step 3 apply. Additionally, the raised derrick can strike overhead utilities, tree limbs or other elevated items	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Location H&S policy and procedure for guidance.	
		2	Hands or fingers can get caught and crushed if trying to clean by hand or with tools while the auger is still turning.	Auger should always be stopped and clutch disengaged prior to cleaning. Cuttings shall not be shoveled from the auger flight while in motion.	
4	Direct push drilling	1	The drill rods will be handled by workers most of the time rather than the rig doing it, therefore pinch points can cause lacerations and crushing of fingers/body parts.	Keep a minimum of 5 feet away from drill rig operation and moving parts.	
		2	The direct push rigs are usually meant to fit in spaces where larger rig cannot. Tight spaces can pin workers.	Do not put yourself between the rig and a fixed object. Use Spotters or a tape measure to ensure clearances in tight areas. Pre-plan equipment movement from one location to the next.	
		3	Some direct push equipment is controlled by wireless devices. These controls can fail and equipment can strike workers or cause damage to property.	The drill rig should be used in a large open area to test wireless controls prior to moving to boring locations. The operator of the rig will test the kill switch with wireless remote prior to use. Operator will stay in range of rig while moving so that wireless signal will not be too weak and cause errors to the controls.	
		4	Sampling sleeves must be cut to obtain access to soil. Cutting can cause lacerations.	It is preferable to let the driller cut the sleeves open. Many drillers have holders for the sleeve to allow for stability when cutting. If you cut the sleeves, use a hook blade, change blade regularly, and cut away from the body.	
		5	Soil cores may contain contaminated media.	Wear nitrile gloves and safety glasses for protection from contaminated media when logging soil borings.	
5	Rotosonic drilling	1	Fire hydrants are often used for water source. Hydrants deliver water at high pressure. Pressurized water can cause flying parts/debris and excessive slipping hazards.	Water usage from fire hydrants should be cleared with local municipalities prior to use. Only persons that know how to use the hydrant should be performing this task. Ensure all connections are tight, and hose line is not run over to cut by traffic. Any leaks from the hydrant should be reported immediately.	
		2	This method requires a lot of clearance. The drill head can turn 90 degrees to attach to the next drill flight or casing. This usually requires a large support truck to park directly behind the rig. As the drill head raises the new casing flight is angled down at the same time until it can be turned completely vertical.	Ensure sufficient overhead clearance.	
		3	Heavy lifting of cores can cause muscle strain.	Always use 2 people to move core containers. Use caution moving core samples to layout area. Plan layout area to ensure adequate aisle space between core runs for logging. Keep back straight and use job rotation.	
		4	The rotosonic drill head can move very quickly up and down while working on a borehole. Moving parts can strike someone or catch body parts.	The operator and helper must communicate and stay clear of the path of the drill head. The drill utilizes two large hydraulic clamps to continuously hold casings while load/unloading previous casings. Do not wear loose clothing.	

6	Sample collection and processing	1	Injuries can result from pinch points on sampling equipment, and from breakage of sample containers.	Care should be taken when opening sampling equipment. Look at empty containers before picking them up, and do not over-tighten container caps. Use dividers to store containers in the cooler so they do not break.	Sample Cooler Handling JSA
		2	Lifting heavy coolers can cause back injuries.	Use two people to move heavy coolers. Use proper lifting techniques.	
7	Monitoring well installation	1	Same hazards as in Step 3 with general drill rig operation	See step 3	
		2	Monitoring well construction materials can clutter the work area causing tripping hazards.	Well construction materials should be picked up during the well installation process.	
		3	Heavy lifting can cause muscle strains, and cutting open bags can cause lacerations.	Well construction materials are usually 50 lbs or greater. Team lift or use drill rig to hoist bags. Always use work gloves while cutting open bags.	
		4	Well pack material (i.e. sand, grout, bentonite) can become airborne and get in your eyes.	Wear safety glasses for protection from airborne sand and dust.	
		5	Cutting the top of the well to size can cause jagged/sharp edges on the top of the well casing.	Wear gloves when working with the top of the well casing, and file any sharp jagged edges that resulted from cutting to size.	
8	Soil cutting and purge water management	1	Moving full drums can cause back injury, or pinching/crushing injury.	Preferably have the drilling contractor move full drums with their equipment. If this is not practicable, use lift assist devices such as drum dollies, lift gates, etc. Employ proper lifting techniques, and perform TRACK to identify pinch/crush points. Wear leather work gloves, and clear all walking and work areas of debris prior to moving a drum.	Drum Handling JSA

PPE	**Personal Protective Equipment**		
Type	**Personal Protective Equipment**	**Description**	**Required**
Eye Protection	safety glasses		Required
Foot Protection	boots	Steel toe boots	Required
Hand Protection	chemical resistant gloves (specify type)	Nitrile	Required
	work gloves (specify type)	leather	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs		Required
Miscellaneous PPE	traffic vest--Class II or III		Required

Supplies			
Type	**Supply**	**Description**	**Required**
Communication Devices	mobile phone		Required
Air monitoring	PID	With 11.7 EV bulb	Required
	Draeger Tubes	Compound Specific for MC	Required
Decontamination	Decon supplies (specify type)	Driller to provide and manage	Recommended
Miscellaneous	fire extinguisher		Required
	Spill Control Kit		Required
	Mechanical Ventilation		Required
	first aid kit, Type B		Required
Personal	eye wash (specify type)	bottle	Required
	water/fluid replacement		Recommended
Traffic Control	traffic cones		Required

ATTACHMENT G

Safety Data Sheets

SAFETY DATA SHEET

Version 4.10
Revision Date 06/02/2016
Print Date 06/20/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Acetone

Product Number : 320110
Brand : Sigma-Aldrich
Index-No. : 606-001-00-8

CAS-No. : 67-64-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.

P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C_3H_6O
Molecular weight	:	58.08 g/mol
CAS-No.	:	67-64-1
EC-No.	:	200-662-2
Index-No.	:	606-001-00-8
Registration number	:	01-2119471330-49-XXXX

Hazardous components

Component	Classification	Concentration
Acetone		
	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319, H336	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Acetone	67-64-1	TWA	500.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Hematologic effects Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC		

		See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation 2015 Adoption Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	750.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Hematologic effects Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	500 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation 2015 Adoption Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	1,000.000000 ppm 2,400.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	250.000000 ppm 590.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		STEL	750 ppm 1,780 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	3,000 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	500 ppm 1,200 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Acetone	67-64-1	Acetone	50.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)

	Remarks	End of shift (As soon as possible after exposure ceases)			
		Acetone	25 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

Derived No Effect Level (DNEL)

Application Area	Exposure routes	Health effect	Value
Workers	Skin contact	Long-term systemic effects	186mg/kg BW/d
Consumers	Ingestion	Long-term systemic effects	62mg/kg BW/d
Consumers	Skin contact	Long-term systemic effects	62mg/kg BW/d
Workers	Inhalation	Acute systemic effects	2420 mg/m3
Workers	Inhalation	Long-term systemic effects	1210 mg/m3
Consumers	Inhalation	Long-term systemic effects	200 mg/m3

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	33.3 mg/kg
Marine water	1.06 mg/l
Fresh water	10.6 mg/l
Marine sediment	3.04 mg/kg
Fresh water sediment	30.4 mg/kg
Onsite sewage treatment plant	100 mg/l

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -94 °C (-137 °F) - lit.
f)	Initial boiling point and boiling range	56 °C (133 °F) at 1,013 hPa (760 mmHg) - lit.
g)	Flash point	-17.0 °C (1.4 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 13 %(V) Lower explosion limit: 2 %(V)
k)	Vapour pressure	533.3 hPa (400.0 mmHg) at 39.5 °C (103.1 °F) 245.3 hPa (184.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.791 g/cm3 at 25 °C (77 °F)
n)	Water solubility	completely miscible
o)	Partition coefficient: n-octanol/water	log Pow: -0.24
p)	Auto-ignition temperature	465.0 °C (869.0 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	23.2 mN/m at 20.0 °C (68.0 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Bases, Oxidizing agents, Reducing agents, Acetone reacts violently with phosphorous oxychloride.

10.6 Hazardous decomposition products
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Carbon oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 5,800 mg/kg
Remarks: Behavioral:Altered sleep time (including change in righting reflex). Behavioral:Tremor. Behavioral:Headache. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

LC50 Inhalation - Rat - 8 h - 50,100 mg/m3
Remarks: Drowsiness Dizziness Unconsciousness

LD50 Dermal - Guinea pig - 7,426 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Mild skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation - 24 h

Respiratory or skin sensitisation
- Guinea pig
Result: Does not cause skin sensitisation.

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: AL3150000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Kidney - Irregularities - Based on Human Evidence
Skin - Dermatitis - Based on Human Evidence
Kidney - Irregularities - Based on Human Evidence
Skin - Dermatitis - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 5,540 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	LC50 - Daphnia magna (Water flea) - 8,800 mg/l - 48 h
Toxicity to algae	Remarks: No data available

12.2 Persistence and degradability

Biodegradability	Result: 91 % - Readily biodegradable (OECD Test Guideline 301B)

12.3 Bioaccumulative potential
Does not bioaccumulate.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1090 Class: 3 Packing group: II
Proper shipping name: Acetone
Reportable Quantity (RQ): 100 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1090 Class: 3 Packing group: II EMS-No: F-E, S-D

Proper shipping name: ACETONE

IATA
UN number: 1090 Class: 3 Packing group: II
Proper shipping name: Acetone

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	2007-03-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information
Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.10 Revision Date: 06/02/2016 Print Date: 06/20/2016

SAFETY DATA SHEET

Version 5.12
Revision Date 06/02/2016
Print Date 11/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Alconox® detergent

Product Number : 242985
Brand : Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Skin irritation (Category 2), H315
Serious eye damage (Category 1), H318
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Acute aquatic toxicity (Category 2), H401

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.
H401 Toxic to aquatic life.

Precautionary statement(s)
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.

P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Hazardous components

Component		Classification	Concentration
Sodium dodecylbenzenesulfonate			
CAS-No. EC-No.	25155-30-0 246-680-4	Acute Tox. 4; Skin Irrit. 2; Eye Dam. 1; Aquatic Acute 2; H302, H315, H318, H401	>= 30 - < 50 %
Tetrasodium pyrophosphate			
CAS-No. EC-No.	7722-88-5 231-767-1	Skin Irrit. 2; Eye Irrit. 2A; STOT SE 3; H315, H319, H335	>= 30 - < 50 %
Sodium carbonate			
CAS-No. EC-No. Index-No.	497-19-8 207-838-8 011-005-00-2	Eye Irrit. 2A; H319	>= 10 - < 20 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Tetrasodium pyrophosphate	7722-88-5	TWA	5.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Hazardous components without workplace control parameters

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance — Form: granular, powder
Colour: white

b)	Odour	odourless
c)	Odour Threshold	No data available
d)	pH	9.5 at 10 g/l
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	soluble
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sulphur oxides, Oxides of phosphorus, Sodium oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Sodium dodecylbenzenesulfonate	25155-30-0	1993-04-24
Tetrasodium pyrophosphate	7722-88-5	2007-03-01
Pentasodium triphosphate	7758-29-4	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Sodium dodecylbenzenesulfonate	25155-30-0	1993-04-24
Tetrasodium pyrophosphate	7722-88-5	2007-03-01
Pentasodium triphosphate	7758-29-4	1993-04-24
Sodium carbonate	497-19-8	

New Jersey Right To Know Components

	CAS-No.	Revision Date
Sodium dodecylbenzenesulfonate	25155-30-0	1993-04-24
Tetrasodium pyrophosphate	7722-88-5	2007-03-01
Pentasodium triphosphate	7758-29-4	1993-04-24
Sodium carbonate	497-19-8	

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Eye Dam.	Serious eye damage
Eye Irrit.	Eye irritation
H302	Harmful if swallowed.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H401	Toxic to aquatic life.
Skin Irrit.	Skin irritation
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.12 Revision Date: 06/02/2016 Print Date: 11/13/2016

SAFETY DATA SHEET

Version 5.6
Revision Date 08/09/2016
Print Date 11/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzene

Product Number : 12540
Brand : Sigma-Aldrich
Index-No. : 601-020-00-8

CAS-No. : 71-43-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1A), H350
Specific target organ toxicity - repeated exposure (Category 1), H372
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H340 May cause genetic defects.

H350	May cause cancer.
H372	Causes damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C_6H_6
Molecular weight	:	78.11 g/mol
CAS-No.	:	71-43-2
EC-No.	:	200-753-7
Index-No.	:	601-020-00-8
Registration number	:	01-2119447106-44-XXXX

Hazardous components

Component	Classification	Concentration
Benzene		
	Flam. Liq. 2; Skin Irrit. 2; Eye Irrit. 2A; Muta. 1B; Carc. 1A; STOT RE 1; Asp. Tox. 1; Aquatic Acute 3; Aquatic Chronic 3; H225, H304, H315, H319, H340, H350, H372, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Flash back possible over considerable distance., Container explosion may occur under fire conditions.

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Benzene	71-43-2	TWA	0.5 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Leukemia Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed human carcinogen Danger of cutaneous absorption		
		STEL	2.5 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Leukemia Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed human carcinogen Danger of cutaneous absorption		
		TWA	10 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.40-1969		
		CEIL	25 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.40-1969		
		Peak	50 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.40-1969		
		See 1910.1028. See Table Z-2 for the limits applicable in the operations or sectors excluded in 1910.1028 The final benzene standard in 1910.1028 applies to all occupational exposures to benzene except some subsegments of industry where exposures are consistently under the action level (i.e., distribution and sale of fuels, sealed containers and pipelines, coke production, oil and gas drilling and production, natural gas processing, and the percentage exclusion for liquid mixtures); for the excepted subsegments, the benzene limits in Table Z-2 apply.		
		TWA	0.1 ppm	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		ST	1 ppm	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benzene	71-43-2	S-	0.0300	In urine	ACGIH - Biological

		Phenylmercapturic acid	mg/g		Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		t,t-Muconic acid	0.5000 mg/g	In urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: clear, colourless
b)	Odour	No data available

c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 5.5 °C (41.9 °F)
f)	Initial boiling point and boiling range	80 °C (176 °F)
g)	Flash point	-11.0 °C (12.2 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 8 %(V) Lower explosion limit: 1.3 %(V)
k)	Vapour pressure	221.3 hPa (166.0 mmHg) at 37.7 °C (99.9 °F) 99.5 hPa (74.6 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.874 g/mL at 25 °C (77 °F)
n)	Water solubility	ca.1.88 g/l at 23.5 °C (74.3 °F) - soluble
o)	Partition coefficient: n-octanol/water	log Pow: 2.13 at 25 °C (77 °F)
p)	Auto-ignition temperature	562.0 °C (1,043.6 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
acids, Bases, Halogens, Strong oxidizing agents, Metallic salts

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male - > 5,960 mg/kg
(OECD Test Guideline 401)

LC50 Inhalation - Rat - female - 4 h - 43.7 mg/l
(OECD Test Guideline 403)

LD50 Dermal - Rabbit - 8,263 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation

Respiratory or skin sensitisation
Maximisation Test - Guinea pig
Result: Does not cause skin sensitisation.

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.
In vivo tests showed mutagenic effects

Chinese hamster lung cells
Result: positive

OECD Test Guideline 475
Mouse - male
Result: positive

Carcinogenicity

Carcinogenicity - Human - male - Inhalation
Tumorigenic:Carcinogenic by RTECS criteria. Leukaemia Blood:Thrombocytopenia.

Carcinogenicity - Rat - Oral
Tumorigenic:Carcinogenic by RTECS criteria. Endocrine:Tumors. Leukaemia

This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Human carcinogen.

IARC:	1 - Group 1: Carcinogenic to humans (Benzene)
NTP:	Known to be human carcinogen (Benzene)
OSHA:	OSHA specifically regulated carcinogen (Benzene)

Reproductive toxicity

Reproductive toxicity - Mouse - Intraperitoneal
Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Embryo or Fetus: Fetal death.

Developmental Toxicity - Rat - Inhalation
Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Developmental Toxicity - Mouse - Inhalation
Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material). Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow).

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
May be fatal if swallowed and enters airways.

Additional Information

Repeated dose toxicity	Rat - male and female - Oral - NOAEL : 100 mg/kg - OECD Test Guideline 408

RTECS: CY1400000

Nausea, Dizziness, Headache, narcosis, Inhalation of high concentrations of benzene may have an initial stimulatory effect on the central nervous system characterized by exhilaration, nervous excitation and/or giddiness, depression, drowsiness, or fatigue. The victim may experience tightness in the chest, breathlessness, and loss of consciousness. Tremors, convulsions, and death due to respiratory paralysis or circulatory collapse can occur in a few minutes to several hours following severe exposures. Aspiration of small amounts of liquid immediately causes pulmonary edema and hemorrhage of pulmonary tissue. Direct skin contact may cause erythema. Repeated or prolonged skin contact may result in drying, scaling dermatitis, or development of secondary skin infections. The chief target organ is the hematopoietic system. Bleeding from the nose, gums, or mucous membranes and the development of purpuric spots, pancytopenia, leukopenia, thrombocytopenia, aplastic anemia, and leukemia may occur as the condition progresses. The bone marrow may appear normal, aplastic or hyperplastic, and may not correlate with peripheral blood-forming tissues. The onset of effects of prolonged benzene exposure may be delayed for many months or years after the actual exposure has ceased., Blood disorders

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 15.00 - 32.00 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Ceriodaphnia dubia (water flea) - 17.2 mg/l - 48 h
Toxicity to algae	Growth inhibition EC50 - Pseudokirchneriella subcapitata (green algae) - 100 mg/l - 72 h (OECD Test Guideline 201)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 d Result: 96 % - Readily biodegradable (OECD Test Guideline 301F)

12.3 Bioaccumulative potential

Bioaccumulation	Leuciscus idus (Golden orfe) - 3 d - 0.05 mg/l Bioconcentration factor (BCF): 10

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1114 Class: 3 Packing group: II
Proper shipping name: Benzene
Reportable Quantity (RQ): 10 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1114 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: BENZENE

IATA
UN number: 1114 Class: 3 Packing group: II
Proper shipping name: Benzene

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benzene	71-43-2	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benzene	71-43-2	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzene	71-43-2	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Benzene	71-43-2	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Benzene	71-43-2	2009-02-01
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Benzene	71-43-2	2009-02-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H340	May cause genetic defects.
H350	May cause cancer.
H372	Causes damage to organs through prolonged or repeated exposure.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 08/09/2016 Print Date: 11/13/2016

SAFETY DATA SHEET

Version 4.7
Revision Date 05/27/2016
Print Date 11/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Bromodichloromethane

Product Number : 139181
Brand : Aldrich

CAS-No. : 75-27-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Skin irritation (Category 2), H315
Serious eye damage (Category 1), H318
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.

P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear eye protection/ face protection.
P280	Wear protective gloves.
P281	Use personal protective equipment as required.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Dichlorobromomethane
Formula	:	$CHBrCl_2$
Molecular weight	:	163.83 g/mol
CAS-No.	:	75-27-4
EC-No.	:	200-856-7

Hazardous components

Component	Classification	Concentration
Bromodichloromethane		
	Acute Tox. 4; Skin Irrit. 2; Eye Dam. 1; Carc. 2; STOT SE 3; H302, H315, H318, H335, H351	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): Non Combustible Liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 120 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -55 °C (-67 °F) - lit.
f)	Initial boiling point and boiling range	87 °C (189 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.98 g/cm3 at 25 °C (77 °F)

n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Strong bases, Magnesium

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas, Hydrogen bromide gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Mouse - 450.0 mg/kg
Remarks: Brain and Coverings:Changes in circulation (hemorrhage,thrombosis, etc.). Liver:Fatty liver degeneration. Blood: Hemorrhage.

TDLo Oral - Rat - 40 mg/kg
Remarks: Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

TDLo Oral - Rat - 35 mg/kg
Remarks: Liver:Other changes. Kidney, Ureter, Bladder:Other changes.

TDLo Oral - Rat - 20.5 mg/kg
Remarks: Liver:Liver function tests impaired.

TDLo Oral - Rat - 400 mg/kg
Remarks: Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels:Hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.). Liver:Other changes.

TDLo Oral - Rat - 2,000 mg/kg
Remarks: Kidney, Ureter, Bladder:Changes in both tubules and glomeruli. Kidney, Ureter, Bladder:Other changes in urine composition.

TDLo Oral - Rat - 9,828 mg/kg
Remarks: Blood:Changes in erythrocyte (RBC) count. Nutritional and Gross Metabolic:Weight loss or decreased weight gain. Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels: Transaminases.

TDLo Oral - Rat - 2,904.6 mg/kg
Remarks: Behavioral:Fluid intake. Nutritional and Gross Metabolic:Weight loss or decreased weight gain. Nutritional and Gross Metabolic:Dehydration.

TDLo Oral - Rat - 5,366.9 mg/kg
Remarks: Kidney, Ureter, Bladder:Changes in kidney weight. Endocrine:Other changes. Skin and Appendages: Other: Hair.

TDLo Oral - Rat - 3,127 mg/kg
Remarks: Behavioral:Fluid intake. Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

TDLo Oral - Rat - 20,075 mg/kg
Remarks: Liver:Fatty liver degeneration. Liver:Other changes. Liver:Changes in liver weight.

TDLo Oral - Rat - 5,670 mg/kg
Remarks: Liver:Changes in liver weight. Blood:Changes in serum composition (e.g., TP, bilirubin, cholesterol). Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

TDLo Oral - Rat - 742 mg/kg
Remarks: Nutritional and Gross Metabolic:Weight loss or decreased weight gain. Behavioral:Food intake (animal).

TDLo Oral - Rat - 2,000 mg/kg
Remarks: Kidney, Ureter, Bladder:Changes in both tubules and glomeruli. Kidney, Ureter, Bladder:Other changes in urine composition.

TDLo Oral - Rat - 375 mg/kg
Remarks: Endocrine:Estrogenic. Blood:Changes in serum composition (e.g., TP, bilirubin, cholesterol).

TDLo Oral - Rat - 750 mg/kg
Remarks: Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels:Hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.). Liver:Changes in liver weight. Kidney, Ureter, Bladder:Other changes.

TDLo Oral - Mouse - 1,000 mg/kg
Remarks: Kidney, Ureter, Bladder:Renal function tests depressed. Blood:Changes in serum composition (e.g., TP, bilirubin, cholesterol).

TDLo Oral - Mouse - 750 mg/kg
Remarks: Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels: Dehydrogenases. Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels: Transaminases. Liver:Changes in liver weight.

TDLo Oral - Rabbit - 59.5 mg/kg
Remarks: Behavioral:Fluid intake. Behavioral:Food intake (animal).

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
Irritating to eyes, respiratory system and skin.

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.

Carcinogenicity

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Bromodichloromethane)

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Bromodichloromethane)

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: Reasonably anticipated to be a human carcinogen (Bromodichloromethane)

NTP: Reasonably anticipated to be a human carcinogen (Bromodichloromethane)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
Inhalation - May cause respiratory irritation.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: PA5310000

prolonged or repeated exposure can cause:, Nausea, Dizziness, Headache, narcosis

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3082 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Bromodichloromethane)
Reportable Quantity (RQ): 5000 lbs

Poison Inhalation Hazard: No

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Bromodichloromethane	75-27-4	2009-07-17

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Bromodichloromethane	75-27-4	2009-07-17

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Bromodichloromethane	75-27-4	2009-07-17

New Jersey Right To Know Components

	CAS-No.	Revision Date
Bromodichloromethane	75-27-4	2009-07-17

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Bromodichloromethane	CAS-No. 75-27-4	Revision Date 2007-09-28
WARNING! This product contains a chemical known to the State of California to cause cancer. Bromodichloromethane	CAS-No. 75-27-4	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Carc.	Carcinogenicity
Eye Dam.	Serious eye damage
H302	Harmful if swallowed.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

Skin Irrit.	Skin irritation
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.7 Revision Date: 05/27/2016 Print Date: 11/13/2016

SAFETY DATA SHEET

Version 3.21
Revision Date 06/02/2016
Print Date 11/18/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Chloroform

Product Number : 02487
Brand : Sigma-Aldrich
Index-No. : 602-006-00-4

CAS-No. : 67-66-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Acute toxicity, Inhalation (Category 3), H331
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Carcinogenicity (Category 2), H351
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Specific target organ toxicity - repeated exposure (Category 1), Liver, Kidney, H372
Acute aquatic toxicity (Category 3), H402

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H331 Toxic if inhaled.
H336 May cause drowsiness or dizziness.

H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H372	Causes damage to organs (Liver, Kidney) through prolonged or repeated exposure.
H402	Harmful to aquatic life.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear eye protection/ face protection.
P280	Wear protective gloves.
P281	Use personal protective equipment as required.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P311	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Trichloromethane Methylidyne trichloride
Formula	:	$CHCl_3$
Molecular weight	:	119.38 g/mol
CAS-No.	:	67-66-3
EC-No.	:	200-663-8
Index-No.	:	602-006-00-4
Registration number	:	01-2119486657-20-XXXX

Hazardous components

Component	Classification	Concentration
Chloroform		
	Acute Tox. 4; Acute Tox. 3; Skin Irrit. 2; Eye Irrit. 2A; Carc. 2; Repr. 2; STOT SE 3; STOT RE 1; Aquatic Acute 3; H302, H315, H319, H331, H336, H351, H361, H372, H402	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Move out of dangerous area.Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Chloroform	67-66-3	TWA	10.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Liver damage Embryo/fetal damage Confirmed animal carcinogen with unknown relevance to humans		
		ST	2.000000 ppm 9.780000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		C	50.000000 ppm 240.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate. Ceiling limit is to be determined from breathing-zone air samples.		
		TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Liver damage Embryo/fetal damage Confirmed animal carcinogen with unknown relevance to humans		
		ST	2 ppm 9.78 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		C	50 ppm 240 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate. Ceiling limit is to be determined from breathing-zone air samples.		
		TWA	2 ppm 9.78 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		PEL	2 ppm 9.78 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -63 °C (-81 °F)
f)	Initial boiling point and boiling range	60.5 - 61.5 °C (140.9 - 142.7 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	213.3 hPa (160.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available

m)	Relative density	1.492 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 1.97
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	27.1 mN/m at 20.0 °C (68.0 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.
Contains the following stabiliser(s):
2-Methyl-2-butene (0.003 %)

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Strong bases, Magnesium, Sodium/sodium oxides, Lithium

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

LD50 Oral - Rat - 908 mg/kg
Remarks: Behavioral:Change in motor activity (specific assay). Behavioral:Ataxia. Lungs, Thorax, or Respiration:Respiratory stimulation.

Inhalation: No data available

LOEC Inhalation - Rat - male - 6 h - 500 ppm

LD50 Dermal - Rabbit - > 20,000 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Irritating to skin. - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Irritating to eyes. - 24 h

Respiratory or skin sensitisation
Did not cause sensitisation on laboratory animals.

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.

Carcinogenicity

Carcinogenicity - Rat - Oral
Tumorigenic:Carcinogenic by RTECS criteria. Leukaemia

The National Cancer Institute (NCI) has found clear evidence for carcinogenicity. Limited evidence of a carcinogenic effect.

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Chloroform)
NTP:	Reasonably anticipated to be a human carcinogen (Chloroform)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
Suspected of damaging the unborn child. Suspected human reproductive toxicant

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1. - Liver, Kidney

Aspiration hazard
No data available

Additional Information
RTECS: FS9100000

Vomiting, Gastrointestinal disturbance, Exposure to and/or consumption of alcohol may increase toxic effects.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Leuciscus idus (Golden orfe) - 162 mg/l - 48 h
	LC100 - Leuciscus idus (Golden orfe) - 220 mg/l - 48 h
	LC50 - other fish - 97 mg/l - 96 h
	LC50 - Danio rerio (zebra fish) - 121 mg/l - 96 h
	NOEC - Oryzias latipes - 122 mg/l - 10 d
	NOEC - Oncorhynchus mykiss (rainbow trout) - 24 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 79.00 mg/l - 24 h
	Immobilization EC50 - Daphnia magna (Water flea) - 51.6 mg/l - 48 h
	NOEC - Daphnia magna (Water flea) - 120 mg/l - 11 d
Toxicity to algae	EC50 - No information available. - 500.00 mg/l - 24 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential

Bioaccumulation Lepomis macrochirus (Bluegill) - 14 d
- 0.11 mg/l

Bioconcentration factor (BCF): 6

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1888 Class: 6.1 Packing group: III
Proper shipping name: Chloroform
Reportable Quantity (RQ): 10 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1888 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: CHLOROFORM

IATA

UN number: 1888 Class: 6.1 Packing group: III
Proper shipping name: Chloroform

15. REGULATORY INFORMATION

SARA 302 Components

The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Chloroform	67-66-3	2008-11-03

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Chloroform	67-66-3	2008-11-03

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Chloroform	67-66-3	2008-11-03

Pennsylvania Right To Know Components

	CAS-No.	Revision Date

Chloroform	67-66-3	2008-11-03

New Jersey Right To Know Components

	CAS-No.	Revision Date
Chloroform	67-66-3	2008-11-03

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Chloroform	CAS-No. 67-66-3	Revision Date 2011-09-01
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Chloroform	CAS-No. 67-66-3	Revision Date 2011-09-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H402	Harmful to aquatic life.
Repr.	Reproductive toxicity
Skin Irrit.	Skin irritation
STOT RE	Specific target organ toxicity - repeated exposure
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.21 Revision Date: 06/02/2016 Print Date: 11/18/2016

SAFETY DATA SHEET

Version 5.2
Revision Date 05/07/2015
Print Date 11/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Dicyclohexylamine

Product Number : 185841
Brand : Aldrich
Index-No. : 612-066-00-3

CAS-No. : 101-83-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Dermal (Category 3), H311
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H301 + H311 Toxic if swallowed or in contact with skin
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.

P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
P362	Take off contaminated clothing and wash before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	$C_{12}H_{23}N$
Molecular weight	:	181.32 g/mol
CAS-No.	:	101-83-7
EC-No.	:	202-980-7
Index-No.	:	612-066-00-3

Hazardous components

Component	Classification	Concentration
Dicyclohexylamine		
	Acute Tox. 3; Skin Corr. 1B; Eye Dam. 1; Aquatic Acute 1; Aquatic Chronic 1; H301 + H311, H314, H410	<= 100 %

No components need to be disclosed according to the applicable regulations.
For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Move out of dangerous area.Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Nitrogen oxides (NOx)

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store under inert gas.
Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 40 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	11 at 1 g/l at 20 °C (68 °F)
e)	Melting point/freezing point	Melting point/range: -2 °C (28 °F) - lit.
f)	Initial boiling point and boiling range	117 - 120 °C (243 - 248 °F) at 13 hPa (10 mmHg) 256 °C (493 °F) - lit.
g)	Flash point	96 °C (205 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or	No data available

	explosive limits	
k)	Vapour pressure	16 hPa (12 mmHg) at 37.7 °C (99.9 °F)
l)	Vapour density	7.26
m)	Relative density	0.912 g/cm3 at 20 °C (68 °F)
n)	Water solubility	0.8 g/l at 25 °C (77 °F)
o)	Partition coefficient: n-octanol/water	log Pow: -0.4 at 25 °C (77 °F)
p)	Auto-ignition temperature	255 °C (491 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density 7.26

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male - 200 mg/kg

LC50 Inhalation - Rat - male - 6 h - > 1.4 mg/l

LD50 Dermal - Rabbit - male and female - 200 - 316 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Causes burns. - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Severe eye irritation

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Ames test
S. typhimurium
Result: negative

Mutagenicity (micronucleus test)
Mouse - male
Result: negative

Carcinogenicity

Carcinogenicity - Rat - Oral
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Gastrointestinal:Tumors. Liver:Tumors.

Carcinogenicity - Mouse - Subcutaneous
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Tumorigenic:Tumors at site or application.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information

Repeated dose toxicity - Rat - male and female - Oral - No observed adverse effect level - 40 mg/kg
RTECS: HY4025000

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	semi-static test LC50 - Oryzias latipes - 12 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - 8 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	EC50 - Desmodesmus subspicatus (green algae) - 3.3 mg/l - 72 h

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 14 d Result: 76.9 % - Readily biodegradable (OECD Test Guideline 301C)

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 2565 Class: 8 Packing group: III
Proper shipping name: Dicyclohexylamine
Reportable Quantity (RQ):

Poison Inhalation Hazard: No

IMDG

UN number: 2565 Class: 8 Packing group: III EMS-No: F-A, S-B
Proper shipping name: DICYCLOHEXYLAMINE
Marine pollutant:yes

IATA

UN number: 2565 Class: 8 Packing group: III
Proper shipping name: Dicyclohexylamine

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Dicyclohexylamine	101-83-7	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Dicyclohexylamine	101-83-7	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Dicyclohexylamine	101-83-7	1993-04-24

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Eye Dam.	Serious eye damage
H301	Toxic if swallowed.
H301 + H311	Toxic if swallowed or in contact with skin
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	
Flammability:	1
Physical Hazard	0

NFPA Rating

Health hazard:	4
Fire Hazard:	1
Reactivity Hazard:	0

Further information

Copyright 2015 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.2 Revision Date: 05/07/2015 Print Date: 11/13/2016

SAFETY DATA SHEET

Version 5.9
Revision Date 09/23/2016
Print Date 11/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Ethylbenzene

Product Number : 03079
Brand : Sigma-Aldrich
Index-No. : 601-023-00-4

CAS-No. : 100-41-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Inhalation (Category 4), H332
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure (Category 2), H373
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H332	Harmful if inhaled.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.
H401	Toxic to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P331	Do NOT induce vomiting.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C_8H_{10}
Molecular weight	:	106.17 g/mol
CAS-No.	:	100-41-4
EC-No.	:	202-849-4
Index-No.	:	601-023-00-4

Hazardous components

Component	Classification	Concentration
Ethylbenzene		
	Flam. Liq. 2; Acute Tox. 4; Carc. 2; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 3; H225, H304, H332, H351, H373, H401, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

hygroscopic

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Ethylbenzene	100-41-4	TWA	20.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Cochlear impair Kidney damage (nephropathy) Upper Respiratory Tract irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		STEL	125.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		TWA	100.000000 ppm 435.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	125.000000 ppm 545.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	100.000000 ppm 435.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	20 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Cochlear impair Kidney damage (nephropathy) Upper Respiratory Tract irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		TWA	100 ppm 435 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	125 ppm 545 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	100 ppm 435 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		

		TWA	100 ppm 435 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		STEL	125 ppm 545 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		PEL	5 ppm 22 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		STEL	30 ppm 130 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Ethylbenzene	100-41-4	Sum of mandelic acid and phenyl glyoxylic acid	0.7g/g creatinine	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		Ethylbenzene		In end-exhaled air	ACGIH - Biological Exposure Indices (BEI)
		Not critical			
		Sum of mandelic acid and phenyl glyoxylic acid	0.15g/g creatinine	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -95 °C (-139 °F) - lit.
f)	Initial boiling point and boiling range	136 °C (277 °F) - lit.
g)	Flash point	15.0 °C (59.0 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 6.7 %(V) Lower explosion limit: 1 %(V)
k)	Vapour pressure	13.3 hPa (10.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.867 g/mL at 25 °C (77 °F)
n)	Water solubility	0.2 g/l at 25 °C (77 °F) - slightly soluble
o)	Partition coefficient: n-octanol/water	log Pow: 3.6 at 20 °C (68 °F)
p)	Auto-ignition temperature	432.0 °C (809.6 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	0.773 mm2/s at 20 °C (68 °F) -
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	71.2 mN/m at 23 °C (73 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - 3,500 mg/kg

Inhalation: No data available

LD50 Dermal - Rabbit - 15,433 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Moderate skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Hamster
ovary
Result: negative

Mouse - male and female
Result: negative

Carcinogenicity

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Ethylbenzene)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
May be fatal if swallowed and enters airways.

Additional Information

Repeated dose toxicity: Rat - male and female - NOAEL : 75 mg/kg - OECD Test Guideline 407
RTECS: DA0700000

Central nervous system depression, Nausea, Headache, Vomiting, Ataxia., Tremors

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Menidia menidia (Atlantic silverside) - 5.1 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 1.8 - 2.4 mg/l - 48 h
	Reproduction Test NOEC - Ceriodaphnia dubia (water flea) - 0.96 mg/l - 7 d
Toxicity to algae	static test EC50 - Skeletonema costatum (marine diatom) - 4.9 mg/l - 72 h

12.2 Persistence and degradability

Biodegradability: aerobic - Exposure time 28 d
Result: 70 - 80 % - Readily biodegradable

12.3 Bioaccumulative potential

Due to the distribution coefficient n-octanol/water, accumulation in organisms is not expected.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1175 Class: 3 Packing group: II
Proper shipping name: Ethylbenzene
Reportable Quantity (RQ): 1000 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1175 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: ETHYLBENZENE

IATA
UN number: 1175 Class: 3 Packing group: II
Proper shipping name: Ethylbenzene

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Ethylbenzene	100-41-4	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Ethylbenzene	100-41-4	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Ethylbenzene	100-41-4	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Ethylbenzene	100-41-4	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Ethylbenzene	100-41-4	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Carc.	Carcinogenicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H332	Harmful if inhaled.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.
H401	Toxic to aquatic life.

HMIS Rating

Health hazard:	1
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3

Reactivity Hazard: 0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.9 Revision Date: 09/23/2016 Print Date: 11/13/2016

Safety Data Sheet

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Material Name	:	**Gasoline**
Other Names / Synonyms	:	MOGAS, ULG 95, 88 RON, 90 RON, 91 RON, 92 RON, 93 RON, 95 RON, 97 UNLD, 91 UNLD
Recommended Use / Restrictions of Use	:	Fuel for spark ignition engines designed to run on unleaded fuel.
Supplier	:	**Shell Eastern Trading (PTE) Ltd** 9 North Buona Vista Drive, #07-01, Tower 1, The Metropolis Singapore 138588 Singapore
Telephone	:	+65-6384 8000
Emergency Telephone Number	:	+44 (0) 151 350 4595

2. HAZARDS IDENTIFICATION

GHS Classification	:	Flammable liquids, Category 1 Skin corrosion/irritation, Category 2 Aspiration hazard, Category 1 Toxic to reproduction, Category 2 Germ cell mutagenicity, Category 1B Carcinogenicity, Category 1B Specific target organ toxicity - single exposure, Category 3, Inhalation, Narcotic effects. Acute hazards to the aquatic environment, Category 2 Hazardous to the aquatic environment - Long-term Hazard, Category 2
GHS Label Elements Symbol(s)	:	
Signal Words	:	Danger
Hazard Statement	:	PHYSICAL HAZARDS:

H224: Extremely flammable liquid and vapour.

HEALTH HAZARDS:
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H361: Suspected of damaging fertility or the unborn child.

ENVIRONMENTAL HAZARDS:
H401: Toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.

GHS Precautionary Statements

Prevention : P201: Obtain special instructions before use.
P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response : P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

Storage : P403+P233: Store in a well-ventilated place. Keep container tightly closed.

Disposal: : P501: Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

Other Hazards which do not result in classification : Liquid evaporates quickly and can ignite leading to a flash fire, or an explosion in a confined space. This material is a static accumulator. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.
Slightly irritating to respiratory system. This product contains benzene which may cause leukaemia (AML - acute myelogenous leukaemia). May cause MDS (Myelodysplastic Syndrome).

Additional Information : This product is intended for use in closed systems only.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture Description : Complex mixture of hydrocarbons consisting of paraffins, cycloparaffins, aromatic and olefinic hydrocarbons with carbon numbers predominantly in the C4 to C12 range. Includes benzene at 0.1 - 5% v/v. Contains oxygenated hydrocarbons which may include methyl tertiary butyl ether (MTBE) and other ethers. May also contain several additives at <0.1% v/v each.

Synonyms : MOGAS, ULG 95, 88 RON, 90 RON, 91 RON, 92 RON, 93 RON, 95 RON, 97 UNLD, 91 UNLD

Classification of components according to GHS

Chemical Identity	Synonyms	CAS	Hazard Class (category)	Hazard Statement	Conc.
Gasoline, low boiling point naphtha	Gasoline, low boiling point naphtha	86290-81-5	Flam. Liq., 1; Skin Corr., 2; Asp. Tox., 1; Muta., 1B; Carc., 1B; STOT SE, 3; Aquatic Chronic, 2; Aquatic Acute, 2; Repr., 2;	H224; H315; H304; H340; H350; H336; H411; H401; H361;	85.00 - 100.00 %
Ethyl tertiary butyl ether	Ethyl tertiary butyl ether	637-92-3	Flam. Liq., 2; STOT SE, 3; Asp. Tox., 2; Aquatic Acute, 3;	H225; H336; H305; H402;	0.00 - 15.00 %
Methyl tertiary butyl ether	Methyl tertiary butyl ether	1634-04-4	Flam. Liq., 2; Skin Corr., 3; Acute Tox., 5; Asp. Tox., 2;	H225; H316; H303; H305;	0.00 - 15.00 %
Tertiary amyl methyl ether	Tertiary amyl methyl ether	994-05-8	Flam. Liq., 2; Acute Tox., 4; STOT SE, 3;	H225; H302; H336;	0.00 - 15.00 %

Additional Information : Contains Benzene, CAS # 71-43-2. Contains Toluene, CAS # 108-88-3. Contains Ethylbenzene, CAS # 100-41-4. Contains n-Hexane, CAS # 110-54-3. Contains Xylene (Mixed Isomers), CAS # 1330-20-7. Contains Cyclohexane, CAS# 110-82-7. Contains Cumene, CAS# 98-82-8 Contains Tri-methyl-benzene (all isomers), CAS# 25551-13-7.

Contains Naphthalene, CAS # 91-20-3.

The amount of oxygenated components is limited at 2.7 % m/m calculated as oxygen. Alcohols may be present at <0.1%v. Dyes and markers can be used to indicate tax status and prevent fraud. Refer to Ch 16 for full text of H phrases.

Refer to chapter 16 for full text of EC R-phrases.

4. FIRST-AID MEASURES

Inhalation	:	Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.
Skin Contact	:	Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.
Eye Contact	:	Flush eyes with water while holding eyelids open. Rest eyes for 30 minutes. If redness, burning, blurred vision, or swelling persist transport to the nearest medical facility for additional treatment.
Ingestion	:	If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.
Most Important Symptoms/Effects, Acute & Delayed	:	Skin irritation signs and symptoms may include a burning sensation, redness, or swelling. Eye irritation signs and symptoms may include a burning sensation and a temporary redness of the eye. If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. The onset of respiratory symptoms may be delayed for several hours after exposure. Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death. Auditory system effects may include temporary hearing loss and/or ringing in the ears.

Immediate medical attention, special treatment	:	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Specific hazards arising from Chemicals	:	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide may be evolved if incomplete combustion occurs. Unidentified organic and inorganic compounds. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Will float and can be reignited on surface water.
Suitable Extinguishing Media	:	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable Extinguishing Media	:	Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.
Protective Equipment & Precautions for Fire Fighters	:	Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).
Additional Advice	:	Keep adjacent containers cool by spraying with water. If possible remove containers from the danger zone. If the fire cannot be extinguished the only course of action is to evacuate immediately. Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with skin, eyes and clothing. Evacuate the area of all non-essential personnel. Ventilate contaminated area thoroughly. If contamination of sites occurs remediation may require specialist advice. Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Material Safety Data Sheet. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Observe the relevant local and international regulations. Take precautionary measures against static discharges.

Personal Precautions, Protective Equipment and Emergency Procedures	:	Do not breathe fumes, vapour. Do not operate electrical equipment. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Vapour can travel for considerable distances both above and below the ground surface. Underground services (drains, pipelines, cable ducts) can provide preferential flow paths. Evacuate all personnel. Attempt to disperse vapour or to direct its flow to a safe location for example using fog sprays.
Environmental Precautions	:	Take measures to minimise the effects on groundwater. Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways. Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.
Methods and Material for Containment and Cleaning Up	:	Take precautionary measures against static discharges. For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
Additional Advice	:	Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained. Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26. To the extent that this product, including its chemical components (e.g. methyl tertiary butyl ether) may impact surface or groundwater, appropriate assessment and remediation (if necessary) should be implemented.

7. HANDLING AND STORAGE

General Precautions	:	Avoid breathing vapours or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for

		safe handling, storage and disposal of this material. Air-dry contaminated clothing in a well-ventilated area before laundering. Prevent spillages. Turn off all battery operated portable electronic devices (examples include: cellular phones, pagers and CD players) before operating gasoline pump. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse. Do not use as a cleaning solvent or other non-motor fuel uses. Vehicle fueling and vehicle workshop areas - Avoid inhalation of vapours and contact with skin, when filling or emptying a vehicle.
Precautions for Safe Handling	:	When using do not eat or drink. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Never siphon by mouth. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Avoid exposure. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
Conditions for Safe Storage	:	Drum and small container storage: Keep containers closed when not in use. Drums should be stacked to a maximum of 3 high. Use properly labelled and closeable containers. Packaged product must be kept tightly closed and stored in a diked (bunded) well-ventilated area, away from, ignition sources and other sources of heat. Take suitable precautions when opening sealed containers, as pressure can build up during storage. Tank storage: Tanks must be specifically designed for use with this product. Bulk storage tanks should be diked (bunded). Locate tanks away from heat and other sources of ignition. Cleaning, inspection and maintenance of storage tanks is a specialist operation, which requires the implementation of strict procedures and precautions. Keep in a cool place. Electrostatic charges will be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk. The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable. Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.
Product Transfer	:	Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to

		accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur. Be aware of handling operations that may give rise to additional hazards that result from the accumulation of static charges. These include but are not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements. These activities may lead to static discharge e.g. spark formation. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (<= 1 m/s until fill pipe submerged to twice its diameter, then <= 7 m/s). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations.
Recommended Materials	:	For containers, or container linings use mild steel, stainless steel. Aluminium may also be used for applications where it does not present an unnecessary fire hazard. Examples of suitable materials are: high density polyethylene (HDPE), polypropylene (PP), and Viton (FKM), which have been specifically tested for compatibility with this product. For container linings, use amine-adduct cured epoxy paint. For seals and gaskets use: graphite, PTFE, Viton A, Viton B.
Unsuitable Materials	:	Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene. However, some may be suitable for glove materials.
Container Advice	:	Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers. Gasoline containers must not be used for storage of other products.
Other Advice	:	Ensure that all local regulations regarding handling and storage facilities are followed. See additional references that provide safe handling practices for liquids that are determined to be static accumulators: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity). CENELEC CLC/TR 50404 (Electrostatics – Code of practice for the avoidance of hazards due to static electricity).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Gasoline, low boiling point naphtha	ACGIH	TWA	300 ppm		
	ACGIH	STEL	500 ppm		
	SG OEL	TWA	300 ppm	890 mg/m3	
	SG OEL	STEL	500 ppm	1,480 mg/m3	
Trimethylbenzene, all isomers	ACGIH	TWA	25 ppm		
	SG OEL	TWA	25 ppm	123 mg/m3	
Ethylbenzene	ACGIH	TWA	20 ppm		
	SG OEL	TWA	100 ppm	434 mg/m3	
	SG OEL	STEL	125 ppm	543 mg/m3	
n-hexane	ACGIH	TWA	50 ppm		
	ACGIH	SKIN_DES			Can be absorbed through the skin.
	SG OEL	TWA	50 ppm	176 mg/m3	
Benzene	ACGIH	TWA	0.5 ppm		
	ACGIH	STEL	2.5 ppm		
	ACGIH	SKIN_DES			Can be absorbed through the skin.
	SG OEL	TWA	1 ppm	3.18 mg/m3	

	SHELL IS	TWA	0.5 ppm	1.6 mg/m3	
	SHELL IS	STEL	2.5 ppm	8 mg/m3	
Toluene	ACGIH	TWA	20 ppm		
	SG OEL	TWA	50 ppm	188 mg/m3	
Xylene	ACGIH	TWA	100 ppm		
	ACGIH	STEL	150 ppm		
	SG OEL	TWA	100 ppm	434 mg/m3	
	SG OEL	STEL	150 ppm	651 mg/m3	
Cyclohexane	ACGIH	TWA	100 ppm		
	SG OEL	TWA	300 ppm	1,030 mg/m3	
Naphthalene	ACGIH	TWA	10 ppm		
	ACGIH	STEL	15 ppm		
	ACGIH	SKIN_DES			Can be absorbed through the skin.
	SG OEL	TWA	10 ppm	52 mg/m3	
	SG OEL	STEL	15 ppm	79 mg/m3	
Ethyl tertiary butyl ether	ACGIH	TWA	25 ppm		
Methyl tertiary butyl ether	ACGIH	TWA	50 ppm		
	SG OEL	TWA	40 ppm	144 mg/m3	
Tertiary amyl methyl ether	ACGIH	TWA	20 ppm		
Cumene	ACGIH	TWA	50 ppm		
	SG OEL	TWA	50 ppm	246 mg/m3	

Additional Information : SHELL IS is the Shell Internal Standard. Skin notation means that significant exposure can also occur by absorption of liquid through the skin and of vapour through the eyes or mucous membranes.

Biological Exposure Index (BEI)

Material	Determinant	Sampling Time	BEI	Reference
Benzene	t,t-Muconic acid in Creatinine in urine	Sampling time: End of shift.	500 µg/g	ACGIH BEL (2011)
	S-Phenylmercapturic acid in Creatinine in urine	Sampling time: End of shift.	25 µg/g	ACGIH BEL (2011)
n-hexane	2,5-Hexanedion, without hydrolysis in Urine	Sampling time: End of shift at end of work week.	0.4 mg/l	ACGIH BEL (2011)
Toluene	o-Cresol, with hydrolysis in Creatinine in urine	Sampling time: End of shift.	0.3 mg/g	ACGIH BEL (2011)
	toluene in Blood	Sampling time: Prior to last shift of work week.	0.02 mg/l	ACGIH BEL (2011)
	toluene in Urine	Sampling time: End of shift.	0.03 mg/l	ACGIH BEL (2011)

Ethylbenzene	Sum of mandelic acid and phenylglyoxylic acid in Creatinine in urine	Sampling time: End of shift at end of work week.	0.7 g/g	ACGIH BEL (2011)
	Ethyl benzene in End-exhaled air	Sampling time: Not critical.		ACGIH BEL (2011)
Xylene	Methylhippuric acids in Creatinine in urine	Sampling time: End of shift.	1.5 g/g	ACGIH BEL (2011)
Naphthalene	1-Naphthol, with hydrolysis + 2-Naphthol, with hydrolysis	Sampling time: End of shift.		ACGIH BEL (02 2013)

Appropriate Engineering Controls : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Use sealed systems as far as possible. Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended. Eye washes and showers for emergency use. Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping. Define procedures for safe handling and maintenance of controls. Educate and train workers in the hazards and control measures relevant to normal activities associated with this product. Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation. Firewater monitors and deluge systems are recommended. Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.

Safety Data Sheet

Individual Protection Measures	:	Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
Respiratory Protection	:	If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. All respiratory protection equipment and use must be in accordance with local regulations. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65°C(149 °F)].
Hand Protection	:	Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognise that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time may be acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Select gloves tested to a relevant standard (e.g. Europe EN374, US F739). When prolonged or frequent repeated contact occurs, Nitrile gloves may be suitable. (Breakthrough time of > 240 minutes.) For incidental contact/splash protection Neoprene, PVC gloves may be suitable.
Eye Protection	:	Chemical splash goggles (chemical monogoggles). If a local risk assessment deems it so, then chemical splash goggles may not be required and safety glasses may provide adequate eye protection.
Protective Clothing	:	Chemical resistant gloves/gauntlets, boots, and apron (where risk of splashing).
Thermal Hazards	:	Not applicable.

Monitoring Methods	:	Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory. Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available. National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/ Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
Environmental Exposure Controls	:	Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour. Take appropriate measures to fulfil the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Yellow. Clear, bright liquid.
Odour	:	Hydrocarbon
Odour threshold	:	Data not available
pH	:	Data not available
Initial Boiling Point and Boiling Range	:	25 - 220 °C / 77 - 428 °F
Freezing Point	:	Data not available
Flash point	:	-40 °C / -40 °F (Tagliabue Closed Cup)
Upper / lower Flammability or Explosion limits	:	1 - 8 %(V)
Auto-ignition temperature	:	> 250 °C / 482 °F
Vapour pressure	:	Typical 570 hPa at 37.8 °C / 100.0 °F
Relative Density	:	Data not available
Density	:	Typical 0.740 g/cm3 at 15 °C / 59 °F
Water solubility	:	Negligible.
Solubility in other solvents	:	Data not available
n-octanol/water partition	:	2 - 7

coefficient (log Pow)		
Dynamic viscosity	:	Data not available
Kinematic viscosity	:	0.5 - 0.75 mm2/s at 40 °C / 104 °F
Vapour density (air=1)	:	Data not available
Electrical conductivity	:	Low conductivity: < 100 pS/m, The conductivity of this material makes it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10 000 pS/m., Whether a liquid is nonconductive or semi-conductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid.
Evaporation rate (nBuAc=1)	:	Data not available
Decomposition Temperature	:	Data not available
Flammability	:	Extremely flammable.

10. STABILITY AND REACTIVITY

Chemical stability	:	Stable under normal conditions of use.
Possibility of Hazardous Reactions	:	No hazardous reaction is expected when handled and stored according to provisions.
Conditions to Avoid	:	Avoid heat, sparks, open flames and other ignition sources.
Incompatible Materials	:	Strong oxidising agents.
Hazardous Decomposition Products	:	Hazardous decomposition products are not expected to form during normal storage. Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.
Hazardous Polymerisation	:	No
Sensitivity to Mechanical Impact	:	No
Sensitivity to Static Discharge	:	Yes, in certain circumstances product can ignite due to static electricity.

11. TOXICOLOGICAL INFORMATION

Information on Toxicological effects

Basis for Assessment	:	Information given is based on product data, a knowledge of the components and the toxicology of similar products. Unless indicated otherwise, the data presented is representative of the

Safety Data Sheet

product as a whole, rather than for individual component(s).

Likely Routes of Exposure	:	Exposure may occur via inhalation, ingestion, skin absorption, skin or eye contact, and accidental ingestion.
Acute Oral Toxicity	:	Low toxicity: LD50 > 5000 mg/kg
Acute Dermal Toxicity	:	Low toxicity: LD50 >2000 mg/kg , Rabbit
Acute Inhalation Toxicity	:	Low toxicity: LC50 >5 mg/l , 4 h, Rat
Skin corrosion/irritation	:	Irritating to skin.
Serious eye damage/irritation	:	Expected to be slightly irritating.
Respiratory Irritation	:	Based on human experience, breathing of vapours or mists may cause a temporary burning sensation to nose, throat and lungs.
Respiratory or skin sensitisation	:	Not expected to be a sensitiser.
Aspiration Hazard	:	Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.
Germ cell mutagenicity	:	May cause heritable genetic damage. (Benzene) Mutagenicity studies on gasoline and gasoline blending streams have shown predominantly negative results.
Carcinogenicity	:	Known human carcinogen. (Benzene) May cause leukaemia (AML - acute myelogenous leukemia). (Benzene) Inhalation exposure to mice causes liver tumours, which are not considered relevant to humans.

Material	:	**Carcinogenicity Classification**
Gasoline, low boiling point naphtha	:	ACGIH Group A3: Confirmed animal carcinogen with unknown relevance to humans.
Gasoline, low boiling point naphtha	:	IARC 2B: Possibly carcinogenic to humans.
Gasoline, low boiling point naphtha	:	GHS / CLP: Carcinogenicity Category 1B
Trimethylbenzene, all isomers	:	GHS / CLP: No carcinogenicity classification
Ethylbenzene	:	IARC 2B: Possibly carcinogenic to humans.
Ethylbenzene	:	GHS / CLP: No carcinogenicity classification
n-hexane	:	GHS / CLP: No carcinogenicity classification

Benzene	:	ACGIH Group A1: Confirmed human carcinogen.
Benzene	:	NTP: Known To Be Human Carcinogen.
Benzene	:	IARC 1: Carcinogenic to humans.
Benzene	:	GHS / CLP: Carcinogenicity Category 1A
Toluene	:	ACGIH Group A4: Not classifiable as a human carcinogen.
Toluene	:	IARC 3: Not classifiable as to carcinogenicity to humans.
Toluene	:	GHS / CLP: No carcinogenicity classification
Xylene	:	ACGIH Group A4: Not classifiable as a human carcinogen.
Xylene	:	IARC 3: Not classifiable as to carcinogenicity to humans.
Xylene	:	GHS / CLP: No carcinogenicity classification
Cyclohexane	:	GHS / CLP: No carcinogenicity classification
Naphthalene	:	ACGIH Group A4: Not classifiable as a human carcinogen.
Naphthalene	:	NTP: Reasonably Anticipated to be a Human Carcinogen.
Naphthalene	:	IARC 2B: Possibly carcinogenic to humans.
Naphthalene	:	GHS / CLP: Carcinogenicity Category 2
Ethyl tertiary butyl ether	:	ACGIH Group A4: Not classifiable as a human carcinogen.
Ethyl tertiary butyl ether	:	GHS / CLP: No carcinogenicity classification
Methyl tertiary butyl ether	:	IARC 3: Not classifiable as to carcinogenicity to humans.
Methyl tertiary butyl ether	:	GHS / CLP: No carcinogenicity classification
Tertiary amyl methyl ether	:	GHS / CLP: No carcinogenicity classification
Cumene	:	IARC 2B: Possibly carcinogenic to humans.
Cumene	:	GHS / CLP: No carcinogenicity classification

Reproductive and Developmental Toxicity : Causes foetotoxicity at doses which are maternally toxic. (Toluene)
May impair fertility at doses which produce other toxic effects. (n-hexane)
Many case studies involving abuse during pregnancy indicate that toluene can cause birth defects, growth retardation and learning difficulties. (Toluene)
Inhalation of high concentrations of gasoline vapour containing Methyl tertiary butyl ether produced a very low incidence of rare birth defects (ventral midline closure failure) in mice.

Specific target organ toxicity - single exposure : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.

Specific target organ toxicity - repeated exposure : Kidney: caused kidney effects in male rats which are not considered relevant to humans

Blood-forming organs: repeated exposure affects the bone

marrow.

Additional Information : Prolonged and repeated exposures to high concentrations have resulted in hearing loss in rats. Solvent abuse and noise interaction in the work environment may cause hearing loss. (Toluene)

Abuse of vapours has been associated with organ damage and death. (Toluene)

Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest.

May cause MDS (Myelodysplastic Syndrome). (Benzene)

Classifications by other authorities under varying regulatory frameworks may exist.

12. ECOLOGICAL INFORMATION

Basis for Assessment : Fuels are typically made from blending several refinery streams. Ecotoxicological studies have been carried out on a variety of hydrocarbon blends and streams but not those containing additives. Information given is based on a knowledge of the components and the ecotoxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Acute Toxicity : Expected to be toxic: LL/EL/IL50 > 1 <= 10 mg/l (to aquatic organisms) LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract.

Fish : Expected to be toxic: LL/EL/IL50 > 1 <= 10 mg/l

Aquatic crustacea : Expected to be toxic: LL/EL/IL50 > 1 <= 10 mg/l

Algae/aquatic plants : Expected to be toxic: LL/EL/IL50 > 1 <= 10 mg/l

Microorganisms : Expected to be harmful: LL/EL/IL50 >10 <= 100 mg/l

Chronic Toxicity

Fish : NOEC/NOEL expected to be > 1.0 - <= 10 mg/l

Aquatic crustacea : NOEC/NOEL expected to be > 1.0 - <= 10 mg/l

Mobility : Evaporates within a day from water or soil surfaces. Large volumes may penetrate soil and could contaminate groundwater. Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment. Ether oxygenates are significantly more water soluble and less biodegradable

		than benzene, toluene, ethyl benzene and xylenes (BTEX). Consequently ether oxygenates have the potential to migrate relatively longer distances than BTEX in groundwater. Contains volatile components. Floats on water. Methyl tertiary butyl ether degradation may result in the formation of tert-butyl alcohol (TBA).
Persistence/degradability	:	Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment. The volatile constituents will oxidize rapidly by photochemical reactions in air. While biodegradation of Methyl tertiary butyl ether has been documented, it is generally less biodegradable than many petroleum hydrocarbons and has a potential to migrate relatively longer distances in groundwater.
Bioaccumulative Potential	:	Contains constituents with the potential to bioaccumulate. Log Kow > =4
Other Adverse Effects	:	Films formed on water may affect oxygen transfer and damage organisms.

13. DISPOSAL CONSIDERATIONS

Material Disposal	:	Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand. Do not dispose into the environment, in drains or in water courses. Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination.
Container Disposal	:	Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard. Do not puncture, cut, or weld uncleaned drums. Send to drum recoverer or metal reclaimer. Do not pollute the soil, water or environment with the waste container.
Local Legislation	:	Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be in compliance.

14. TRANSPORT INFORMATION

Land (as per ADR classification): Regulated

Class	:	3
Packing group	:	II
Hazard indentification no.	:	33
UN number	:	1203
Danger label (primary risk)	:	3
Proper shipping name	:	GASOLINE (UNLEADED)
Environmentally Hazardous	:	Yes

IMDG

Identification number	UN 1203
Proper shipping name	GASOLINE
Technical name	(UNLEADED)
Class / Division	3
Packing group	II
Environmental hazards:	Yes

IATA (Country variations may apply)

UN number	:	1203
Proper shipping name	:	Gasoline
Technical name	:	(UNLEADED)
Class / Division	:	3
Packing group	:	II

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Pollution Category	**:**	Not applicable.
Ship Type	**:**	Not applicable.
Product Name	**:**	Not applicable.
Special Precaution	**:**	Not applicable.
Additional Information	**:**	MARPOL Annex 1 rules apply for bulk shipments by sea.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Local Regulations

Workplace Safety and Health Act & Workplace	:	This product is subject to the requirement in the Act/ Regulations.

Safety and Health (General Provision) Regulations		
Environmental Protection and Management Act and Environmental Protection and Management (Hazardous Substances) Regulations	:	This product is subject to the requirement in the Act/ Regulations.
Maritime and Port Authority of Singapore (Dangerous Goods, Petroleum and Explosives) Regulations	:	This product is subject to the requirement in the Act/ Regulations.
Fire Safety Act and Fire Safety (Petroleum & Flammable Materials) Regulations	:	This product is subject to the requirement in the Act/ Regulations.
Classification triggering components	:	Contains gasoline, low boiling point naphtha, unspecified.

16. OTHER INFORMATION

Hazard Statement

H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H303	May be harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H305	May be harmful if swallowed and enters airways.
H315	Causes skin irritation.
H316	Causes mild skin irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H361	Suspected of damaging fertility or the unborn child.
H401	Toxic to aquatic life.
H402	Harmful to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

Additional Information	:	This document contains important information to ensure the safe storage, handling and use of this product. The information in this document should be brought to the attention of the person in your organisation responsible for advising on safety matters.
SDS Version Number	:	1.0
SDS Effective Date	:	10.03.2014

Safety Data Sheet

SDS Revisions	:	A vertical bar (|) in the left margin indicates an amendment from the previous version.
Uses and Restrictions	:	This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier. This product is not to be used as a solvent or cleaning agent; for lighting or brightening fires; as a skin cleanser. This product is designed only to suit automotive applications and no provision is made for the requirements of aviation applications.
SDS Distribution	:	The information in this document should be made available to all who may handle the product.
Key/Legend to Abbrevations used in this SDS	:	The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

Flam. Liq.	Flammable liquids
Asp. Tox.	Aspiration hazard
Muta.	Germ cell mutagenicity
Carc.	Carcinogenicity
Skin Corr.	Skin corrosion/irritation
STOT SE	Specific target organ toxicity - single exposure
	Toxic for Reproduction

Key Literature References	:	The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc).
Disclaimer	:	This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SAFETY DATA SHEET

Version 5.6
Revision Date 03/07/2014
Print Date 11/14/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Hydrochloric acid

Product Number : 435570
Brand : Sigma-Aldrich
Index-No. : 017-002-01-X
REACH No. : 01-2119484862-27-XXXX
CAS-No. : 7647-01-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Corrosive to metals (Category 1), H290
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.
H335 May cause respiratory irritation.

Precautionary statement(s)
P234 Keep only in original container.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301 + P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/ physician.
P321	Specific treatment (see supplemental first aid instructions on this label).
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P406	Store in corrosive resistant stainless steel container with a resistant inner liner.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : HCl
Molecular Weight : 36.46 g/mol

Hazardous components

Component		Classification	Concentration
Hydrochloric acid			
CAS-No.	7647-01-0	Met. Corr. 1; Skin Corr. 1B; Eye Dam. 1; STOT SE 3; H290, H314, H335	30 - 50 %
EC-No.	231-595-7		
Index-No.	017-002-01-X		
Registration number	01-2119484862-27-XXXX		

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
no data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Hydrogen chloride gas
Hydrogen chloride gas

5.3 Advice for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information

no data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Hydrochloric acid	7647-01-0	C	2 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Not classifiable as a human carcinogen		
		C	5 ppm 7 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate. Ceiling limit is to be determined from breathing-zone air samples.		

		C	5 ppm 7 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		C	5 ppm 7 mg/m3	USA. NIOSH Recommended Exposure Limits
		Often used in an aqueous solution.		

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 120 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: light yellow
b)	Odour	pungent
c)	Odour Threshold	no data available
d)	pH	no data available
e)	Melting point/freezing	-30 °C (-22 °F)

	point	
f)	Initial boiling point and boiling range	> 100 °C (> 212 °F)
g)	Flash point	not applicable
h)	Evapouration rate	no data available
i)	Flammability (solid, gas)	no data available
j)	Upper/lower flammability or explosive limits	no data available
k)	Vapour pressure	227 hPa (170 mmHg) at 21.1 °C (70.0 °F) 547 hPa (410 mmHg) at 37.7 °C (99.9 °F)
l)	Vapour density	no data available
m)	Relative density	1.2 g/mL at 25 °C (77 °F)
n)	Water solubility	soluble
o)	Partition coefficient: n-octanol/water	no data available
p)	Auto-ignition temperature	no data available
q)	Decomposition temperature	no data available
r)	Viscosity	no data available
s)	Explosive properties	no data available
t)	Oxidizing properties	no data available

9.2 Other safety information
no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
no data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
no data available

10.4 Conditions to avoid
no data available

10.5 Incompatible materials
Bases, Amines, Alkali metals, Metals, permanganates, e.g. potassium permanganate, Fluorine, metal acetylides, hexalithium disilicide

10.6 Hazardous decomposition products
Other decomposition products - no data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
no data available (Hydrochloric acid)

Inhalation: no data available (Hydrochloric acid)

Dermal: no data available (Hydrochloric acid)

no data available (Hydrochloric acid)

Skin corrosion/irritation
Skin - rabbit
Result: Causes burns.

Serious eye damage/eye irritation
Eyes - rabbit (Hydrochloric acid)
Result: Corrosive to eyes

Respiratory or skin sensitisation
no data available (Hydrochloric acid)

Germ cell mutagenicity
no data available (Hydrochloric acid)

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification. (Hydrochloric acid)

(Hydrochloric acid)

(Hydrochloric acid)

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Hydrochloric acid)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
no data available (Hydrochloric acid)

no data available (Hydrochloric acid)

Specific target organ toxicity - single exposure
The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation. (Hydrochloric acid)

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard
no data available (Hydrochloric acid)

Additional Information
RTECS: MW4025000

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. (Hydrochloric acid)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Gambusia affinis (Mosquito fish) - 282 mg/l - 96 h (Hydrochloric acid)

12.2 Persistence and degradability
no data available

12.3 Bioaccumulative potential
no data available

12.4 Mobility in soil
no data available (Hydrochloric acid)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1789 Class: 8 Packing group: II
Proper shipping name: Hydrochloric acid
Reportable Quantity (RQ): 13514 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG

UN number: 1789 Class: 8 Packing group: II EMS-No: F-A, S-B
Proper shipping name: HYDROCHLORIC ACID
Marine pollutant: No

IATA

UN number: 1789 Class: 8 Packing group: II
Proper shipping name: Hydrochloric acid

15. REGULATORY INFORMATION

REACH No. : 01-2119484862-27-XXXX

SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Hydrochloric acid	7647-01-0	1993-04-24

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Hydrochloric acid	7647-01-0	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Water	7732-18-5	
Hydrochloric acid	7647-01-0	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Water	7732-18-5	
Hydrochloric acid	7647-01-0	1993-04-24

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Eye Dam.	Serious eye damage
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.
Met. Corr.	Corrosive to metals
Skin Corr.	Skin corrosion
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

Copyright 2014 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 03/07/2014 Print Date: 11/14/2016

SAFETY DATA SHEET

Version 5.6
Revision Date 05/23/2016
Print Date 11/14/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Hexane

Product Number : 52750
Brand : Sigma-Aldrich
Index-No. : 601-037-00-0

CAS-No. : 110-54-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Specific target organ toxicity - repeated exposure, Oral (Category 2), Nervous system, H373
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H361 Suspected of damaging fertility or the unborn child.
H373 May cause damage to organs (Nervous system) through prolonged or

	repeated exposure if swallowed.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	*n*-Hexane
Formula	:	C_6H_{14}
Molecular weight	:	86.18 g/mol
CAS-No.	:	110-54-3
EC-No.	:	203-777-6
Index-No.	:	601-037-00-0
Registration number	:	01-2119480412-44-XXXX

Hazardous components

Component	Classification	Concentration
n-Hexane		
	Flam. Liq. 2; Skin Irrit. 2; Repr. 2; STOT SE 3; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 2; H225, H304, H315, H336, H361, H373, H411	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
n-Hexane	110-54-3	TWA	50.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Eye irritation Peripheral neuropathy Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	50.000000 ppm 180.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	500.000000 ppm 1,800.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	50 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Eye irritation Peripheral neuropathy Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	50 ppm 180 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	500 ppm 1,800 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	50 ppm 180 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		PEL	50 ppm 180 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
n-Hexane	110-54-3	2,5-Hexanedione	0.4 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 59 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	7.0
e)	Melting point/freezing point	Melting point/range: -95 °C (-139 °F)
f)	Initial boiling point and	69 °C (156 °F)

	boiling range	
g)	Flash point	-26.0 °C (-14.8 °F) - closed cup
h)	Evaporation rate	15.8
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 7.7 %(V) Lower explosion limit: 1.2 %(V)
k)	Vapour pressure	341.3 hPa (256.0 mmHg) at 37.7 °C (99.9 °F) 176.0 hPa (132.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.659 g/mL at 25 °C (77 °F)
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: 3.90 - 4.11
p)	Auto-ignition temperature	234.0 °C (453.2 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 25,000 mg/kg

LC50 Inhalation - Rat - 4 h - 48000 ppm

Dermal: No data available

No data available

Skin corrosion/irritation
Irritating to skin.

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

Overexposure may cause reproductive disorder(s) based on tests with laboratory animals. Suspected human reproductive toxicant Suspected of damaging fertility.

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
Ingestion - May cause damage to organs through prolonged or repeated exposure. - Nervous system

Aspiration hazard
May be fatal if swallowed and enters airways.

Additional Information
RTECS: MN9275000

Prolonged or repeated contact with skin may cause:, defatting, Dermatitis, Contact with eyes can cause:, Redness, Blurred vision, Provokes tears., Effects due to ingestion may include:, Gastrointestinal discomfort, Central nervous system depression, Lung irritation, chest pain, pulmonary edema, giddiness, slowed reaction time, slurred speech, Headache, Dizziness, Drowsiness, Unconsciousness

Testes. - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 2.5 mg/l - 96.0 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 3,878.00 mg/l - 48 h
Toxicity to algae	EC50 - Chlorella vulgaris (Fresh water algae) - 12,840.00 mg/l - 3 h
	EC50 - SKELETOMA - 0.30 mg/l - 8 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1208 Class: 3 Packing group: II
Proper shipping name: Hexanes
Reportable Quantity (RQ): 5000 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1208 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: HEXANES
Marine pollutant:yes

IATA

UN number: 1208 Class: 3 Packing group: II
Proper shipping name: Hexanes

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
n-Hexane	110-54-3	2007-07-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
n-Hexane	110-54-3	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
n-Hexane	110-54-3	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
n-Hexane	110-54-3	2007-07-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure if swallowed.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
Repr.	Reproductive toxicity

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 05/23/2016 Print Date: 11/14/2016

SAFETY DATA SHEET

Version 4.7
Revision Date 02/24/2016
Print Date 11/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 2-Methylpropene

Product Number : 295469
Brand : Aldrich
Index-No. : 601-012-00-4

CAS-No. : 115-11-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable gases (Category 1), H220
Gases under pressure (Liquefied gas), H280
Simple Asphyxiant,

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 Eliminate all ignition sources if safe to do so.
P410 + P403 Protect from sunlight. Store in a well-ventilated place.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : Isobutylene

Formula : C_4H_8
Molecular weight : 56.11 g/mol
CAS-No. : 115-11-7
EC-No. : 204-066-3
Index-No. : 601-012-00-4

Hazardous components

Component	Classification	Concentration
2-Methylpropene		
	Flam. Gas 1; Press. Gas Liquefied gas; SA ; H220, H280,	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Clean up promptly by sweeping or vacuum.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): Gases

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
2-Methylpropene	115-11-7	TWA	250.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation body weight effects Not classifiable as a human carcinogen		
		TWA	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation body weight effects Not classifiable as a human carcinogen		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 60 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Liquefied gas
b)	Odour	unpleasant
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -140 °C (-220 °F)
f)	Initial boiling point and boiling range	-6.9 °C (19.6 °F) - lit.
g)	Flash point	-79.99 °C (-111.98 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 9.6 %(V) Lower explosion limit: 1.8 %(V)
k)	Vapour pressure	4,370 hPa (3,278 mmHg) at 37.7 °C (99.9 °F)
l)	Vapour density	2.25
m)	Relative density	No data available

n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 2.34
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density 2.25

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents, Strong acids, Halogens

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LC50 Inhalation - Rat - 4 h - 620,000 mg/m3

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: UD0890000

Acts as a simple asphyxiant by displacing air., Dizziness, Disorientation, Headache, excitement, Central nervous system depression, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1055 Class: 2.1
Proper shipping name: Isobutylene
Reportable Quantity (RQ):

Poison Inhalation Hazard: No

IMDG
UN number: 1055 Class: 2.1 EMS-No: F-D, S-U

Proper shipping name: ISOBUTYLENE

IATA
UN number: 1055 Class: 2.1
Proper shipping name: Isobutylene
IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Sudden Release of Pressure Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
2-Methylpropene	115-11-7	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
2-Methylpropene	115-11-7	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
2-Methylpropene	115-11-7	1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

	May displace oxygen and cause rapid suffocation.
Flam. Gas	Flammable gases
H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
Press. Gas	Gases under pressure
SA	Simple Asphyxiant

HMIS Rating

Health hazard:	1
Chronic Health Hazard:	*
Flammability:	4
Physical Hazard	0

NFPA Rating

Health hazard:	1
Fire Hazard:	4
Reactivity Hazard:	0
Health hazard:	0
Fire Hazard:	4
Reactivity Hazard:	0

Further information
Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the

product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.7 Revision Date: 02/24/2016 Print Date: 11/13/2016

SAFETY DATA SHEET

Version 6.4
Revision Date 09/23/2016
Print Date 11/14/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Methanol

Product Number : 82762
Brand : Sigma-Aldrich
Index-No. : 603-001-00-X

CAS-No. : 67-56-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Specific target organ toxicity - single exposure (Category 1), H370

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled
H370 Causes damage to organs.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.

P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P311	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor.
P307 + P311	IF exposed: Call a POISON CENTER or doctor/ physician.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Methyl alcohol
Formula	:	CH_4O
Molecular weight	:	32.04 g/mol
CAS-No.	:	67-56-1
EC-No.	:	200-659-6
Index-No.	:	603-001-00-X
Registration number	:	01-2119433307-44-XXXX

Hazardous components

Component	Classification	Concentration
Methanol		
	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301 + H311 + H331, H370	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Methanol	67-56-1	TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Headache		

		Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250.000000 ppm 325.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200 ppm 260 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250 ppm 325 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200 ppm 260 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		

		STEL	250 ppm 325 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
		TWA	200 ppm 260 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
		C	1,000 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		
		PEL	200 ppm 260 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		
		STEL	250 ppm 325 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methanol	67-56-1	Methanol	15.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		Methanol	15 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

Derived No Effect Level (DNEL)

Application Area	Exposure routes	Health effect	Value
Workers	Skin contact	Long-term systemic effects	40mg/kg BW/d
Consumers	Skin contact	Long-term systemic effects	8mg/kg BW/d
Consumers	Ingestion	Long-term systemic effects	8mg/kg BW/d
Workers	Skin contact	Acute systemic effects	40mg/kg BW/d
Consumers	Skin contact	Acute systemic effects	8mg/kg BW/d
Consumers	Ingestion	Acute systemic effects	8mg/kg BW/d
Workers	Inhalation	Acute systemic effects	260 mg/m3
Workers	Inhalation	Acute local effects	260 mg/m3
Workers	Inhalation	Long-term systemic effects	260 mg/m3
Workers	Inhalation	Long-term local effects	260 mg/m3
Consumers	Inhalation	Acute systemic effects	50 mg/m3
Consumers	Inhalation	Acute local effects	50 mg/m3
Consumers	Inhalation	Long-term systemic effects	50 mg/m3
Consumers	Inhalation	Long-term local effects	50 mg/m3

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	23.5 mg/kg
Marine water	15.4 mg/l
Fresh water	154 mg/l
Fresh water sediment	570.4 mg/kg
Onsite sewage treatment plant	100 mg/kg

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 31 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	pungent
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -98 °C (-144 °F)
f)	Initial boiling point and boiling range	64.7 °C (148.5 °F)
g)	Flash point	9.7 °C (49.5 °F) - closed cup

h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 36 %(V) Lower explosion limit: 6 %(V)
k)	Vapour pressure	130.3 hPa (97.7 mmHg) at 20.0 °C (68.0 °F) 546.6 hPa (410.0 mmHg) at 50.0 °C (122.0 °F) 169.27 hPa (126.96 mmHg) at 25.0 °C (77.0 °F)
l)	Vapour density	1.11
m)	Relative density	0.791 g/mL at 25 °C (77 °F)
n)	Water solubility	completely miscible
o)	Partition coefficient: n-octanol/water	log Pow: -0.77
p)	Auto-ignition temperature	455.0 °C (851.0 °F) at 1,013 hPa (760 mmHg)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	Not explosive
t)	Oxidizing properties	The substance or mixture is not classified as oxidizing.

9.2 Other safety information

Minimum ignition energy	0.14 mJ
Conductivity	< 1 µS/cm
Relative vapour density	1.11

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LDLO Oral - Human - 143 mg/kg
Remarks: Lungs, Thorax, or Respiration:Dyspnea. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

LD50 Oral - Rat - 1,187 - 2,769 mg/kg

LC50 Inhalation - Rat - 4 h - 128.2 mg/l

LC50 Inhalation - Rat - 6 h - 87.6 mg/l

LD50 Dermal - Rabbit - 17,100 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation

Respiratory or skin sensitisation
Maximisation Test - Guinea pig
Does not cause skin sensitisation.
(OECD Test Guideline 406)

Germ cell mutagenicity
Ames test
S. typhimurium
Result: negative

in vitro assay
fibroblast
Result: negative
Mutation in mammalian somatic cells.

Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Mouse - male and female
Result: negative

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
Damage to fetus not classifiable

Fertility classification not possible from current data.

Specific target organ toxicity - single exposure
Causes damage to organs.

Specific target organ toxicity - repeated exposure
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard
No aspiration toxicity classification

Additional Information
RTECS: PC1400000

Effects due to ingestion may include:, Headache, Dizziness, Drowsiness, metabolic acidosis, Coma, Seizures., Methyl alcohol may be fatal or cause blindness if swallowed.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality LC50 - Lepomis macrochirus (Bluegill) - 15,400.0 mg/l - 96 h
	NOEC - Oryzias latipes - 7,900 mg/l - 200 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - > 10,000.00 mg/l - 48 h
Toxicity to algae	Growth inhibition EC50 - Scenedesmus capricornutum (fresh water algae) - 22,000.0 mg/l - 96 h

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 5 d Result: 72 % - rapidly biodegradable
Biochemical Oxygen Demand (BOD)	600 - 1,120 mg/g
Chemical Oxygen Demand (COD)	1,420 mg/g
Theoretical oxygen demand	1,500 mg/g

12.3 Bioaccumulative potential

Bioaccumulation	Cyprinus carpio (Carp) - 72 d at 20 °C - 5 mg/l Bioconcentration factor (BCF): 1.0

12.4 Mobility in soil

Will not adsorb on soil.

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

Additional ecological information	Avoid release to the environment.
Stability in water	at 19 °C83 - 91 % - 72 h Remarks: Hydrolyses on contact with water.Hydrolyses readily.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1230 Class: 3 Packing group: II
Proper shipping name: Methanol
Reportable Quantity (RQ): 5000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1230 Class: 3 (6.1) Packing group: II EMS-No: F-E, S-D
Proper shipping name: METHANOL

IATA
UN number: 1230 Class: 3 (6.1) Packing group: II
Proper shipping name: Methanol

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Methanol	67-56-1	2012-03-16

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H370	Causes damage to organs.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3

Reactivity Hazard: 0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 6.4 Revision Date: 09/23/2016 Print Date: 11/14/2016

SAFETY DATA SHEET

Version 5.4
Revision Date 09/23/2016
Print Date 11/14/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name	:	Methylene Chloride
Product Number	:	PHR1557
Brand	:	Sigma-Aldrich
Index-No.	:	602-004-00-3
CAS-No.	:	75-09-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA
Telephone	:	+1 800-325-5832
Fax	:	+1 800-325-5052

1.4 Emergency telephone number

Emergency Phone #	:	+1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 3), Respiratory system, Central nervous system, H335, H336
Specific target organ toxicity - repeated exposure, Oral (Category 2), Liver, Blood, H373
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Central nervous system, H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word: Warning

Hazard statement(s)

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H373	May cause damage to organs (Liver, Blood) through prolonged or repeated exposure if swallowed.
H373	May cause damage to organs (Central nervous system) through

prolonged or repeated exposure if inhaled.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Molecular weight	:	84.93 g/mol
CAS-No.	:	75-09-2
EC-No.	:	200-838-9
Index-No.	:	602-004-00-3

Hazardous components

Component	Classification	Concentration
Methylene chloride		
	Skin Irrit. 2; Eye Irrit. 2A; Carc. 2; STOT SE 3; STOT RE 2; H315, H319, H335, H336, H351, H373, H373	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store at Room Temperature.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Potential Occupational Carcinogen See Appendix A		
Methylene chloride	75-09-2	TWA	50.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Carboxyhemoglobinemia Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		

		TWA	50 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Carboxyhemoglobinemia Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		Substance listed; for more information see OSHA document 1910.1052		
		Substance listed; for more information see OSHA document 1910.1052		
		See Table Z-2		
		PEL	25.000000 ppm	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1052 This section applies to all occupational exposures to methylene chloride (MC), Chemical Abstracts Service Registry Number 75-09-2, in general industry, construction and shipyard employment. Methylene chloride (MC) means an organic compound with chemical formula, CH2Cl2. Its Chemical Abstracts Service Registry Number is 75-09-2. Its molecular weight is 84.9 g/mole OSHA specifically regulated carcinogen		
		STEL	125.000000 ppm	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1052 This section applies to all occupational exposures to methylene chloride (MC), Chemical Abstracts Service Registry Number 75-09-2, in general industry, construction and shipyard employment. Methylene chloride (MC) means an organic compound with chemical formula, CH2Cl2. Its Chemical Abstracts Service Registry Number is 75-09-2. Its molecular weight is 84.9 g/mole OSHA specifically regulated carcinogen		
		PEL	25 ppm 87 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		see section 5202		
		STEL	125 ppm 435 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		see section 5202		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methylene chloride	75-09-2	Dichloromethane	0.3000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-97.0 °C (-142.6 °F)
f)	Initial boiling point and boiling range	40.0 °C (104.0 °F) at 1,013.2 hPa (760.0 mmHg)
g)	Flash point	No data available
h)	Evaporation rate	0.71
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 19 %(V) Lower explosion limit: 12 %(V)
k)	Vapour pressure	470.9 hPa (353.2 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	2.93 - (Air = 1.0)
m)	Relative density	1.32 g/cm3
n)	Water solubility	slightly soluble
o)	Partition coefficient: n-octanol/water	log Pow: 1.25
p)	Auto-ignition temperature	556.1 °C (1,033.0 °F) 662.0 °C (1,223.6 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density	2.93 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat, flames and sparks. Exposure to sunlight.

10.5 Incompatible materials
Alkali metals, Aluminum, Strong oxidizing agents, Bases, Amines, Magnesium, Strong acids and strong bases, Vinyl compounds

10.6 Hazardous decomposition products
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

LD50 Oral - Rat - > 2,000 mg/kg

Inhalation: No data available

LC50 Inhalation - Rat - 52,000 mg/m3

Dermal: No data available

LD50 Dermal - Rat - > 2,000 mg/kg
(OECD Test Guideline 402)

No data available

No data available

Skin corrosion/irritation
No data available

Skin - Rabbit
Result: Irritating to skin. - 24 h
(Draize Test)

Serious eye damage/eye irritation
No data available

Eyes - Rabbit
Result: Irritating to eyes. - 24 h
(Draize Test)

Respiratory or skin sensitisation
No data available

No data available

Germ cell mutagenicity
No data available

Rat

DNA damage

Carcinogenicity

Carcinogenicity - Rat - Inhalation
Tumorigenic:Carcinogenic by RTECS criteria. Endocrine:Tumors.

Limited evidence of carcinogenicity in animal studies

Suspected human carcinogens

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: OSHA specifically regulated carcinogen (Methylene chloride)

Reproductive toxicity
No data available
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Dichloromethane is metabolized in the body producing carbon monoxide which increases and sustains carboxyhemoglobin levels in the blood, reducing the oxygen-carrying capacity of the blood., Acts as a simple asphyxiant by displacing air., anesthetic effects, Difficulty in breathing, Headache, Dizziness, Prolonged or repeated contact with skin may cause:, defatting, Dermatitis, Contact with eyes can cause:, Redness, Blurred vision, Provokes tears., Effects due to ingestion may include:, Gastrointestinal discomfort, Central nervous system depression, Paresthesia., Drowsiness, Convulsions, Conjunctivitis., Pulmonary edema. Effects may be delayed., Irregular breathing., Stomach/intestinal disorders, Nausea, Vomiting, Increased liver enzymes., Weakness, Heavy or prolonged skin exposure may result in the absorption of harmful amounts of material., Abdominal pain
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 193.00 mg/l - 96 h
	NOEC - Cyprinodon variegatus (sheepshead minnow) - 130 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 1,682.00 mg/l - 48 h

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1593 Class: 6.1 Packing group: III
Proper shipping name: Dichloromethane
Reportable Quantity (RQ): 1000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1593 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: DICHLOROMETHANE

IATA
UN number: 1593 Class: 6.1 Packing group: III
Proper shipping name: Dichloromethane

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Methylene chloride	CAS-No. 75-09-2	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure if swallowed.
Skin Irrit.	Skin irritation
STOT RE	Specific target organ toxicity - repeated exposure
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.4 Revision Date: 09/23/2016 Print Date: 11/14/2016

SAFETY DATA SHEET

Version 5.9
Revision Date 09/23/2016
Print Date 11/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 4-Methyl-2-pentanone

Product Number : 02474
Brand : Sigma-Aldrich
Index-No. : 606-004-00-4

CAS-No. : 108-10-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Inhalation (Category 4), H332
Eye irritation (Category 2A), H319
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

	understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P281	Use personal protective equipment as required.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Repeated exposure may cause skin dryness or cracking.
May form explosive peroxides.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Isobutyl methyl ketone Methyl isobutyl ketone Isopropylacetone
Formula	:	$C_6H_{12}O$
Molecular weight	:	100.16 g/mol
CAS-No.	:	108-10-1
EC-No.	:	203-550-1
Index-No.	:	606-004-00-4
Registration number	:	01-2119473980-30-XXXX

Hazardous components

Component	Classification	Concentration
4-Methylpentan-2-one		
	Flam. Liq. 2; Acute Tox. 4; Eye Irrit. 2A; Carc. 2; STOT SE 3; H225, H319, H332, H335, H351	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
4-Methylpentan-2-one	108-10-1	STEL	75 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Headache Dizziness Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		STEL	75.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Headache Dizziness Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		TWA	50 ppm 205 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		STEL	75 ppm 300 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	100 ppm 410 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	100.000000 ppm 410.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	20 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Headache Dizziness Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		TWA	20.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Headache Dizziness Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		

		TWA	50.000000 ppm 205.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	75.000000 ppm 300.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	50 ppm 205 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		STEL	75 ppm 300 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
4-Methylpentan-2-one	108-10-1	methyl isobutyl ketone	2.0000 mg/l	In urine	
	Remarks	End of shift (As soon as possible after exposure ceases)			
		methyl isobutyl ketone	1.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			
		methyl isobutyl ketone	1 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 175 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -80 °C (-112 °F) - lit.
f)	Initial boiling point and boiling range	117 - 118 °C (243 - 244 °F)
g)	Flash point	14 °C (57 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 8 %(V) Lower explosion limit: 1.2 %(V)
k)	Vapour pressure	20 hPa (15 mmHg) at 20 °C (68 °F)
l)	Vapour density	3.46 - (Air = 1.0)
m)	Relative density	0.801 g/cm3 at 25 °C (77 °F)
n)	Water solubility	ca.20 g/l
o)	Partition coefficient: n-octanol/water	log Pow: 1.31
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	23.6 mN/m at 20 °C (68 °F)
Relative vapour density	3.46 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.
Test for peroxide formation before distillation or evaporation. Test for peroxide formation or discard after 1 year.
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Oxidizing agents, Strong bases

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 2,080 mg/kg

LC50 Inhalation - Rat - 4 h - 8.2 - 16.4 mg/m3

LD50 Dermal - Rabbit - > 16,000 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Mild skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Moderate eye irritation - 24 h

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	2B - Group 2B: Possibly carcinogenic to humans (4-Methylpentan-2-one)
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Developmental Toxicity - Mouse - Inhalation
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

Developmental Toxicity - Mouse - Inhalation
Specific Developmental Abnormalities: Central nervous system. Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

Specific target organ toxicity - single exposure
May cause respiratory irritation.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: SA9275000

Blurred vision, Dermatitis, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC0 - Leuciscus idus melanotus - 480 mg/l - 48 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 1,550 - 3,623 mg/l - 24 h
Toxicity to algae	EC50 - Desmodesmus subspicatus (green algae) - 980 - 2,000 mg/l - 48 h

12.2 Persistence and degradability

Biodegradability Biotic/Aerobic - Exposure time 7 d

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1245 Class: 3 Packing group: II
Proper shipping name: Methyl isobutyl ketone
Reportable Quantity (RQ): 5000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1245 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: METHYL ISOBUTYL KETONE

IATA
UN number: 1245 Class: 3 Packing group: II
Proper shipping name: Methyl isobutyl ketone

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
4-Methylpentan-2-one	108-10-1	1993-04-24

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
4-Methylpentan-2-one	108-10-1	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
4-Methylpentan-2-one	108-10-1	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
4-Methylpentan-2-one	108-10-1	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. 4-Methylpentan-2-one	CAS-No. 108-10-1	Revision Date 2011-11-18
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 4-Methylpentan-2-one	CAS-No. 108-10-1	Revision Date 2011-11-18

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	1
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information
Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the

product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.9 Revision Date: 09/23/2016 Print Date: 11/13/2016

SAFETY DATA SHEET

Version 5.7
Revision Date 09/23/2016
Print Date 11/14/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Methyl tert-butyl ether solution

Product Number : CRM48483
Brand : Supelco
Index-No. : 603-001-00-X

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Specific target organ toxicity - single exposure (Category 1), H370

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled
H370 Causes damage to organs.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.

P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P307 + P311	IF exposed: Call a POISON CENTER or doctor/ physician.
P322	Specific measures (see supplemental first aid instructions on this label).
P330	Rinse mouth.
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Hazardous components

Component		Classification	Concentration
Methanol			
CAS-No.	67-56-1	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301 + H311 + H331, H370	>= 90 - <= 100 %
EC-No.	200-659-6		
Index-No.	603-001-00-X		
Registration number	01-2119433307-44-XXXX		

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Methanol	67-56-1	TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		

		STEL	250.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250.000000 ppm 325.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200 ppm 260 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250 ppm 325 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200 ppm 260 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		STEL	250 ppm 325 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
		TWA	200 ppm 260 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		

		C	1,000 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		
		PEL	200 ppm 260 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		
		STEL	250 ppm 325 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methanol	67-56-1	Methanol	15.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		Methanol	15 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 30 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	pungent
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -98.0 °C (-144.4 °F)
f)	Initial boiling point and boiling range	64.0 - 65.0 °C (147.2 - 149.0 °F) at 1,013 hPa (760 mmHg)
g)	Flash point	9.7 °C (49.5 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 36 %(V) Lower explosion limit: 6 %(V)
k)	Vapour pressure	546.6 hPa (410.0 mmHg) at 50.0 °C (122.0 °F) 130.3 hPa (97.7 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.79 g/cm3 at 20 °C (68 °F)
n)	Water solubility	completely miscible
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Dissociation constant	15.3

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

Methyl alcohol may be fatal or cause blindness if swallowed., Cannot be made non-poisonous., Effects due to ingestion may include:, Nausea, Headache, Vomiting, Gastrointestinal disturbance, Dizziness, Weakness, Confusion., Drowsiness, Unconsciousness, May cause convulsions.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence
Central nervous system - (tert-Butyl methyl ether)

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1230 Class: 3 Packing group: II
Proper shipping name: Methanol, solution
Reportable Quantity (RQ):

Poison Inhalation Hazard: No

IMDG
UN number: 1230 Class: 3 (6.1) Packing group: II EMS-No: F-E, S-D
Proper shipping name: METHANOL, SOLUTION

IATA
UN number: 1230 Class: 3 (6.1) Packing group: II
Proper shipping name: Methanol, solution

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01
tert-Butyl methyl ether	1634-04-4	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H370	Causes damage to organs.
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.7 Revision Date: 09/23/2016 Print Date: 11/14/2016

SAFETY DATA SHEET

Version 5.8
Revision Date 06/02/2016
Print Date 11/18/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Sodium hydroxide solution

Product Number : 415413
Brand : Sigma-Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Corrosive to metals (Category 1), H290
Skin corrosion (Category 1), H314
Serious eye damage (Category 1), H318
Acute aquatic toxicity (Category 3), H402

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H402	Harmful to aquatic life.

Precautionary statement(s)

P234	Keep only in original container.
P264	Wash skin thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.
P405	Store locked up.
P406	Store in corrosive resistant stainless steel container with a resistant inner liner.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : HNaO
Molecular weight : 40.00 g/mol

Hazardous components

Component		Classification	Concentration
Sodium hydroxide			
CAS-No.	1310-73-2	Met. Corr. 1; Skin Corr. 1A; Eye Dam. 1; Aquatic Acute 3; H290, H314, H318, H402	>= 50 - < 70 %
EC-No.	215-185-5		
Index-No.	011-002-00-6		
Registration number	01-2119457892-27-XXXX		

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): Non-combustible, corrosive hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Sodium hydroxide	1310-73-2	TWA	2.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		C	2.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Eye irritation Skin irritation		
		C	2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Eye irritation Skin irritation		

		C	2.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		C	2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	14.0

e)	Melting point/freezing point	-12 - 10 °C (10 - 50 °F)
f)	Initial boiling point and boiling range	105 - 140 °C (221 - 284 °F)
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	< 24 hPa (< 18 mmHg) at 20 °C (68 °F)
l)	Vapour density	1.38 - (Air = 1.0)
m)	Relative density	1.515 g/mL at 25 °C (77 °F)
n)	Water solubility	completely miscible, soluble
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density 1.38 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Water, acids, Organic materials, Chlorinated solvents, Aluminum, Phosphorus, Tin/tin oxides, Zinc

10.6 Hazardous decomposition products
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Sodium oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1824 Class: 8 Packing group: II
Proper shipping name: Sodium hydroxide solution
Reportable Quantity (RQ): 2000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1824 Class: 8 Packing group: II EMS-No: F-A, S-B
Proper shipping name: SODIUM HYDROXIDE SOLUTION

IATA
UN number: 1824 Class: 8 Packing group: II
Proper shipping name: Sodium hydroxide solution

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Sodium hydroxide	1310-73-2	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Water	7732-18-5	
Sodium hydroxide	1310-73-2	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Water	7732-18-5	
Sodium hydroxide	1310-73-2	2007-03-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Eye Dam.	Serious eye damage
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H402	Harmful to aquatic life.
Met. Corr.	Corrosive to metals
Skin Corr.	Skin corrosion

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.8 Revision Date: 06/02/2016 Print Date: 11/18/2016

SAFETY DATA SHEET

Version 5.8
Revision Date 05/27/2016
Print Date 11/14/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Naphthalene

Product Number : 84679
Brand : Sigma-Aldrich
Index-No. : 601-052-00-2

CAS-No. : 91-20-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable solids (Category 2), H228
Acute toxicity, Oral (Category 4), H302
Carcinogenicity (Category 2), H351
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Warning

Hazard statement(s)
H228 Flammable solid.
H302 Harmful if swallowed.
H351 Suspected of causing cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	$C_{10}H_8$
Molecular weight	:	128.17 g/mol
CAS-No.	:	91-20-3
EC-No.	:	202-049-5
Index-No.	:	601-052-00-2

Hazardous components

Component	Classification	Concentration
Naphthalene		
	Flam. Sol. 2; Acute Tox. 4; Carc. 2; Aquatic Acute 1; Aquatic Chronic 1; H228, H302, H351, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): Flammable solid hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Naphthalene	91-20-3	TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Hemolytic anemia Upper Respiratory Tract irritation Cataract Confirmed animal carcinogen with unknown relevance to humans		

		Danger of cutaneous absorption		
		TWA	10.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Hematologic effects Upper Respiratory Tract irritation Eye irritation Eye damage Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Not classifiable as a human carcinogen Danger of cutaneous absorption		
		STEL	15.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Hematologic effects Upper Respiratory Tract irritation Eye irritation Eye damage Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Not classifiable as a human carcinogen Danger of cutaneous absorption		
		TWA	10.000000 ppm 50.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	10.000000 ppm 50.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	15.000000 ppm 75.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	10 ppm 50 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	15 ppm 75 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	10 ppm 50 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	10 ppm 50 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		STEL	15 ppm 75 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		PEL	0.1 ppm 0.5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Naphthalene	91-20-3	1-Naphthol + 2-Naphthol			ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: flakes, granules Colour: white
b)	Odour	aromatic
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 79.5 - 81.0 °C (175.1 - 177.8 °F)
f)	Initial boiling point and boiling range	218 °C (424 °F) - lit.

g)	Flash point	80.0 °C (176.0 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 5.9 %(V) Lower explosion limit: 0.9 %(V)
k)	Vapour pressure	1.3 hPa (1.0 mmHg) at 53.0 °C (127.4 °F) 0.04 hPa (0.03 mmHg) at 25.0 °C (77.0 °F)
l)	Vapour density	No data available
m)	Relative density	1.085 g/cm3 at 24.7 °C (76.5 °F)
n)	Water solubility	0.0308 g/l at 25 °C (77 °F) - OECD Test Guideline 105 - slightly soluble
o)	Partition coefficient: n-octanol/water	log Pow: 3.4 at 25 °C (77 °F)
p)	Auto-ignition temperature	526.0 °C (978.8 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	1.05 mm2/s at 81.5 °C (178.7 °F) -
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	31.8 mN/m at 100.0 °C (212.0 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 490.0 mg/kg

LC50 Inhalation - Rat - male and female - 4 h - > 0.4 mg/l
(OECD Test Guideline 403)

LD50 Dermal - Rabbit - 20,000 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation

Respiratory or skin sensitisation
Maximisation Test - Guinea pig
Result: Does not cause skin sensitisation.
(OECD Test Guideline 406)

Germ cell mutagenicity
Ames test
S. typhimurium
Result: negative

Rat - male
Result: negative

Carcinogenicity

Carcinogenicity - Rat - male and female - inhalation (vapour)
Tumorigenic:Tumors at site or application.

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Naphthalene)
NTP:	Reasonably anticipated to be a human carcinogen (Naphthalene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information

Repeated dose toxicity	Rat - male and female - Oral - NOAEL : 100 mg/kg - LOAEL : 400 mg/kg - OECD Test Guideline 408

RTECS: QJ0525000

Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer., Naphthalene is retinotoxic and systemic absorption of its vapors above 15ppm, may result in:, cataracts, optic neuritis, corneal injury, Eye irritation, Ingestion may provoke the following symptoms:, hemolytic anemia, hemoglobinuria, Nausea, Headache, Vomiting, Gastrointestinal disturbance, Convulsions, anemia, Kidney injury may occur., Seizures., Coma.

Heart -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Pimephales promelas (fathead minnow) - 7.9 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic	static test EC50 - Daphnia magna (Water flea) - 2.16 mg/l - 48 h

invertebrates

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 28 d
Result: 2 % - Not readily biodegradable.

12.3 Bioaccumulative potential

Bioaccumulation Fish

Bioconcentration factor (BCF): 427 - 1,158

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1334 Class: 4.1 Packing group: III
Proper shipping name: Naphthalene, crude
Reportable Quantity (RQ): 100 lbs
Marine pollutant:yes
Poison Inhalation Hazard: No

IMDG

UN number: 1334 Class: 4.1 Packing group: III EMS-No: F-A, S-G
Proper shipping name: NAPHTHALENE, CRUDE
Marine pollutant:yes Marine pollutant: yes

IATA

UN number: 1334 Class: 4.1 Packing group: III
Proper shipping name: Naphthalene, crude

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Naphthalene	91-20-3	2007-07-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Naphthalene	91-20-3	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Naphthalene	91-20-3	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Naphthalene	91-20-3	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Naphthalene	91-20-3	1990-01-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Flam. Sol.	Flammable solids
H228	Flammable solid.
H302	Harmful if swallowed.
H351	Suspected of causing cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	2
Physical Hazard	2

NFPA Rating

Health hazard:	2
Fire Hazard:	2
Reactivity Hazard:	2

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.8 Revision Date: 05/27/2016 Print Date: 11/14/2016

SAFETY DATA SHEET

Version 5.8
Revision Date 05/23/2016
Print Date 11/18/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Nitric acid

Product Number : 07006
Brand : Sigma-Aldrich

CAS-No. : 7697-37-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Oxidizing liquids (Category 3), H272
Corrosive to metals (Category 1), H290
Skin corrosion (Category 1A), H314
Serious eye damage (Category 1), H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H272 May intensify fire; oxidizer.
H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.

Precautionary statement(s)
P210 Keep away from heat.
P220 Keep/Store away from clothing/ combustible materials.
P221 Take any precaution to avoid mixing with combustibles.
P234 Keep only in original container.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face

	protection.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P363	Wash contaminated clothing before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P390	Absorb spillage to prevent material damage.
P405	Store locked up.
P406	Store in corrosive resistant stainless steel container with a resistant inner liner.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : HNO_3

Molecular weight : 63.01 g/mol

Hazardous components

Component		Classification	Concentration
Nitric acid			
CAS-No.	7697-37-2	Ox. Liq. 3; Met. Corr. 1; Skin Corr. 1A; Eye Dam. 1; H272, H290, H314	>= 50 - < 70 %
EC-No.	231-714-2		
Index-No.	007-004-00-1		
Registration number	01-2119487297-23-XXXX		

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking.Keep away from heat and sources of ignition.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): Oxidizing hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Nitric acid	7697-37-2	TWA	2.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Eye irritation Dental erosion		
		STEL	4.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Eye irritation Dental erosion		

		ST	4.000000 ppm 10.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	2.000000 ppm 5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	2.000000 ppm 5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		PEL	2 ppm 5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		STEL	4 ppm 10 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Derived No Effect Level (DNEL)

Application Area	Exposure routes	Health effect	Value
Workers	Inhalation	Acute local effects	2.6 mg/m3
Workers	Inhalation	Long-term local effects	1.3 mg/m3
Consumers	Inhalation	Acute local effects	1.3 mg/m3
Consumers	Inhalation	Long-term local effects	0.65 mg/m3

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nature latex/chloroprene
Minimum layer thickness: 0.6 mm
Break through time: 120 min
Material tested:Lapren® (KCL 706 / Aldrich Z677558, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	< 1.0
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	120.5 °C (248.9 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	49 hPa (37 mmHg) at 50 °C (122 °F)
l)	Vapour density	No data available
m)	Relative density	1.37 - 1.41 g/cm3 at 20 °C (68 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Alkali metals, Acetic anhydride, Organic materials, Alcohols, Acetonitrile, Acrylonitrile

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Nitrogen oxides (NOx)
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Inhalation may provoke the following symptoms:, spasm, inflammation and edema of the bronchi, spasm, inflammation and edema of the larynx, pneumonitis, Symptoms and signs of poisoning are:, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Pulmonary edema. Effects may be delayed., Large doses may cause: conversion of hemoglobin to methemoglobin, producing cyanosis; marked fall in blood pressure, leading to collapse, coma, and possibly death.

Liver - Irregularities - Based on Human Evidence
Liver - Irregularities - Based on Human Evidence (Nitric acid)

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2031 Class: 8 (5.1) Packing group: II
Proper shipping name: Nitric acid
Reportable Quantity (RQ): 1515 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 2031 Class: 8 (5.1) Packing group: II EMS-No: F-A, S-Q
Proper shipping name: NITRIC ACID

IATA
UN number: 2031 Class: 8 (5.1) Packing group: II
Proper shipping name: Nitric acid
IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION

SARA 302 Components
The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Nitric acid	7697-37-2	2007-07-01

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Nitric acid	7697-37-2	2007-07-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Nitric acid	7697-37-2	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Nitric acid	7697-37-2	2007-07-01
Water	7732-18-5	

New Jersey Right To Know Components

	CAS-No.	Revision Date
Nitric acid	7697-37-2	2007-07-01
Water	7732-18-5	

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Eye Dam.	Serious eye damage
H272	May intensify fire; oxidizer.
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
Met. Corr.	Corrosive to metals
Ox. Liq.	Oxidizing liquids
Skin Corr.	Skin corrosion

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	3

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	2
Special hazard.I:	OX

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.8 Revision Date: 05/23/2016 Print Date: 11/18/2016

SAFETY DATA SHEET

1. Identification

Product identifier **PVC Regular Clear Cement**

Other means of identification

Product code 1100E

Synonyms Part Numbers: 31012, 31013, 31014, 31015, 31016, 31958, 31959, 31960, 31961

Recommended use Joining PVC Pipes

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Company Name Oatey Co.

Address 4700 West 160th St.
Cleveland, OH 44135

Telephone 216-267-7100

E-mail info@oatey.com

Transport Emergency Chemtrec 1-800-424-9300 (Outside the US 1-703-527-3887)

Emergency First Aid 1-877-740-5015

Contact person MSDS Coordinator

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 2
Health hazards	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
	Aspiration hazard	Category 1

OSHA defined hazards Not classified.

Label elements



Signal word Danger

Hazard statement Highly flammable liquid and vapor. Harmful if swallowed. May be fatal if swallowed and enters airways. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. May cause drowsiness or dizziness.

Precautionary statement

Prevention Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Avoid breathing mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection.

Response If swallowed: Immediately call a poison center/doctor. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center/doctor if you feel unwell. Rinse mouth. Do NOT induce vomiting. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash before reuse. In case of fire: Use appropriate media to extinguish.

Storage	Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. May form explosive peroxides. Contains a chemical classified by the US EPA as a suspected possible carcinogen.

Supplemental information

Not applicable.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Methyl ethyl ketone	78-93-3	25-40
Cyclohexanone	108-94-1	10-25
Furan, Tetrahydro-	109-99-9	10-25
Acetone	67-64-1	5-15
Polyvinyl chloride	9002-86-2	5-15

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
Skin contact	Take off immediately all contaminated clothing. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Ingestion	Call a physician or poison control center immediately. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Aspiration may cause pulmonary edema and pneumonitis.
Most important symptoms/effects, acute and delayed	Irritation of nose and throat. Aspiration may cause pulmonary edema and pneumonitis. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea. Skin irritation. May cause redness and pain.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed.
General information	Take off all contaminated clothing immediately. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media	Alcohol resistant foam. Water fog. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Highly flammable liquid and vapor. This product contains tetrahydrofuran that may form explosive organic peroxide when exposed to air or light or with age.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Keep combustibles (wood, paper, oil, etc.) away from spilled material. This product is miscible in water.

Large Spills: Stop the flow of material, if this is without risk. Use water spray to reduce vapors or divert vapor cloud drift. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions

Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Vapors may form explosive mixtures with air. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Do not taste or swallow. When using, do not eat, drink or smoke. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Type	Value
Polyvinyl chloride (CAS 9002-86-2)	STEL	5 ppm
	TWA	1 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Acetone (CAS 67-64-1)	PEL	2400 mg/m3	
		1000 ppm	
Cyclohexanone (CAS 108-94-1)	PEL	200 mg/m3	
		50 ppm	
Furan, Tetrahydro- (CAS 109-99-9)	PEL	590 mg/m3	
		200 ppm	
Methyl ethyl ketone (CAS 78-93-3)	PEL	590 mg/m3	
		200 ppm	
Polyvinyl chloride (CAS 9002-86-2)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Acetone (CAS 67-64-1)	STEL	750 ppm	
	TWA	500 ppm	
Cyclohexanone (CAS 108-94-1)	STEL	50 ppm	
	TWA	20 ppm	
Furan, Tetrahydro- (CAS 109-99-9)	STEL	100 ppm	
	TWA	50 ppm	
Methyl ethyl ketone (CAS 78-93-3)	STEL	300 ppm	
	TWA	200 ppm	
Polyvinyl chloride (CAS 9002-86-2)	TWA	1 mg/m3	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Acetone (CAS 67-64-1)	TWA	590 mg/m3
		250 ppm
Cyclohexanone (CAS 108-94-1)	TWA	100 mg/m3
		25 ppm
Furan, Tetrahydro- (CAS 109-99-9)	STEL	735 mg/m3
		250 ppm
	TWA	590 mg/m3
		200 ppm
Methyl ethyl ketone (CAS 78-93-3)	STEL	885 mg/m3
		300 ppm
	TWA	590 mg/m3
		200 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Acetone (CAS 67-64-1)	50 mg/l	Acetone	Urine	*
Cyclohexanone (CAS 108-94-1)	80 mg/l	1,2-Cyclohexanediol, with hydrolysis	Urine	*
	8 mg/l	Cyclohexanol, with hydrolysis	Urine	*
Furan, Tetrahydro- (CAS 109-99-9)	2 mg/l	Tetrahydrofuran	Urine	*
Methyl ethyl ketone (CAS 78-93-3)	2 mg/l	MEK	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines

US - California OELs: Skin designation

Cyclohexanone (CAS 108-94-1) Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies

Cyclohexanone (CAS 108-94-1) Skin designation applies.

US - Tennessee OELs: Skin designation

Cyclohexanone (CAS 108-94-1) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

Cyclohexanone (CAS 108-94-1) Can be absorbed through the skin.
Furan, Tetrahydro- (CAS 109-99-9) Can be absorbed through the skin.

US. NIOSH: Pocket Guide to Chemical Hazards

Cyclohexanone (CAS 108-94-1) Can be absorbed through the skin.

Appropriate engineering controls	Explosion-proof general and local exhaust ventilation. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection	Face shield is recommended. Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves.
Other	Wear appropriate chemical resistant clothing.
Respiratory protection	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Physical state	Liquid.
Form	Translucent liquid.
Color	Clear.
Odor	Solvent.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	151 °F (66.11 °C)
Flash point	-4.0 °F (-20.0 °C)
Evaporation rate	5.5 - 8
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	1.8
Flammability limit - upper (%)	11.8
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	145 mm Hg @ 20 C
Vapor density	2.5
Relative density	0.9 +/- 0.02
Solubility(ies)	
Solubility (water)	Negligible
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	80 - 500 cP
Other information	
VOC (Weight %)	488 g/l SCAQMD 1168/M316A

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials	Acids. Strong oxidizing agents. Ammonia. Amines. Isocyanates. Caustics.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May be fatal if swallowed and enters airways. Headache. Nausea, vomiting. May cause irritation to the respiratory system. Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea. Prolonged inhalation may be harmful.
Skin contact	Causes skin irritation.
Eye contact	Causes serious eye irritation.
Ingestion	May be fatal if swallowed and enters airways. Harmful if swallowed. Harmful if swallowed. Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.
Symptoms related to the physical, chemical and toxicological characteristics	Irritation of nose and throat. Aspiration may cause pulmonary edema and pneumonitis. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Skin irritation. May cause redness and pain. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.

Information on toxicological effects

Acute toxicity May be fatal if swallowed and enters airways. Narcotic effects. May cause respiratory irritation.

Components	Species	Test Results
Acetone (CAS 67-64-1)		
Acute		
Dermal		
LD50	Rabbit	20 ml/kg
Inhalation		
LC50	Rat	50 mg/l, 8 Hours
Oral		
LD50	Rat	5800 mg/kg
Cyclohexanone (CAS 108-94-1)		
Acute		
Dermal		
LD50	Rabbit	948 mg/kg
Inhalation		
LC50	Rat	8000 ppm, 4 hours
Oral		
LD50	Rat	1540 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/eye irritation	Causes serious eye irritation.

Respiratory or skin sensitization

Respiratory sensitization	Not available.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity In 2012 USEPA Integrated Risk Information System (IRIS) reviewed a two species inhalation lifetime study on THF conducted by NTP (1998). Male rats developed renal tumors and female mice developed liver tumors while neither the female rats nor the male mice showed similar results. Because the carcinogenic mechanisms could not be identified clearly in either species for either tumor, the EPA determined that the male rat and female mouse findings are relevant to the assessment of carcinogenic potential in humans. Therefore, the IRIS review concludes that these data in aggregate indicate that there is "suggestive evidence of carcinogenic potential" following exposure to THF by all routes of exposure.

IARC Monographs. Overall Evaluation of Carcinogenicity

Cyclohexanone (CAS 108-94-1)	3 Not classifiable as to carcinogenicity to humans.
Polyvinyl chloride (CAS 9002-86-2)	3 Not classifiable as to carcinogenicity to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Polyvinyl chloride (CAS 9002-86-2)	Cancer

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Narcotic effects. May cause drowsiness and dizziness. Respiratory tract irritation.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard May be fatal if swallowed and enters airways.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components		Species	Test Results
Acetone (CAS 67-64-1)			
Aquatic			
Fish	LC50	Fathead minnow (Pimephales promelas)	> 100 mg/l, 96 hours
Cyclohexanone (CAS 108-94-1)			
Aquatic			
Fish	LC50	Fathead minnow (Pimephales promelas)	481 - 578 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Partition coefficient n-octanol / water (log Kow)

Acetone (CAS 67-64-1)	-0.24
Cyclohexanone (CAS 108-94-1)	0.81
Furan, Tetrahydro- (CAS 109-99-9)	0.46
Methyl ethyl ketone (CAS 78-93-3)	0.29

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN1993
UN proper shipping name	Flammable liquids, n.o.s. (Methyl ethyl ketone RQ = 12788 LBS, Acetone RQ = 50505 LBS)
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	IB2, T7, TP1, TP8, TP28
Packaging exceptions	150
Packaging non bulk	202
Packaging bulk	242

IATA

UN number	UN1993
UN proper shipping name	Flammable liquid, n.o.s. (Methyl ethyl ketone, Acetone)
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	No.
ERG Code	3H
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN1993
UN proper shipping name	FLAMMABLE LIQUID, N.O.S. (Methyl ethyl ketone, Acetone)
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	
Marine pollutant	No.
EmS	F-E, S-E
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not available.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Polyvinyl chloride (CAS 9002-86-2)	Cancer Central nervous system Liver Blood Flammability

CERCLA Hazardous Substance List (40 CFR 302.4)

Acetone (CAS 67-64-1)	LISTED
Cyclohexanone (CAS 108-94-1)	LISTED
Furan, Tetrahydro- (CAS 109-99-9)	LISTED
Methyl ethyl ketone (CAS 78-93-3)	LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Acetone (CAS 67-64-1)	6532
Methyl ethyl ketone (CAS 78-93-3)	6714

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Acetone (CAS 67-64-1)	35 %WV
Methyl ethyl ketone (CAS 78-93-3)	35 %WV

DEA Exempt Chemical Mixtures Code Number

Acetone (CAS 67-64-1)	6532
Methyl ethyl ketone (CAS 78-93-3)	6714

US state regulations

US. Massachusetts RTK - Substance List

Acetone (CAS 67-64-1)
Cyclohexanone (CAS 108-94-1)
Furan, Tetrahydro- (CAS 109-99-9)
Methyl ethyl ketone (CAS 78-93-3)

US. New Jersey Worker and Community Right-to-Know Act

Acetone (CAS 67-64-1)
Cyclohexanone (CAS 108-94-1)
Furan, Tetrahydro- (CAS 109-99-9)
Methyl ethyl ketone (CAS 78-93-3)
Polyvinyl chloride (CAS 9002-86-2)

US. Pennsylvania Worker and Community Right-to-Know Law

Acetone (CAS 67-64-1)
Cyclohexanone (CAS 108-94-1)
Furan, Tetrahydro- (CAS 109-99-9)
Methyl ethyl ketone (CAS 78-93-3)

US. Rhode Island RTK

Acetone (CAS 67-64-1)
Cyclohexanone (CAS 108-94-1)
Furan, Tetrahydro- (CAS 109-99-9)
Methyl ethyl ketone (CAS 78-93-3)

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 05-27-2015

Revision date -

Version # 01

HMIS® ratings
Health: 2
Flammability: 3
Physical hazard: 0

NFPA ratings



Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available. Oatey Co. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use.

Essroc
Italcementi Group

Safety Data Sheet - Portland Cement Based Materials

Section 1. Identification

GHS product identifier:	Portland Cement Based Materials
Chemical name:	Calcium compounds, calcium silicate compounds, and other calcium compounds containing iron and aluminum make up the majority of this product.
Other means of identification:	Cement, masonry cement, mortar cement, portland cement and lime, hydraulic cement, portland cement silicate, portland limestone cement. Covers Products: i.work Saylor's, i.work OPTIMO, i.work Stabil-CEM, i.pro BRIXMENT, i.pro VELVET, i.pro BRICK-LOK, i.pro BLX, i.pro Saylor's PLUS, i.pro Stabil-CEM, i.pro Contempra, i.pro VITA, i.idro Saylor's, i.tech BRIXMENT, i.tech Saylor's, i.tech STONE-HOLD, i.tech Encase-MENT, i.design flamingo-BRIXMENT
Relevant identified uses of the substance or mixture and uses advised against:	Building materials, construction, a basic ingredient in concrete.
Supplier's details:	3251 Bath Pike • Nazareth, PA 18064 • 800-437-7762 • essroc.com • us.i-nova.net County Road 49, Picton, ON. K0K 2T0 • essroc.com • us.i-nova.net
Emergency telephone number (24-hour emergency information)	800-424-9300 Chemtrec

Section 2. Hazards Identification

DANGER! Overexposure to portland cement can cause serious, potentially irreversible skin or eye damage in the form of chemical (caustic) burns, including third degree burns. The same serious injury can occur if wet or moist skin has prolonged contact exposure to dry portland cement.

Portland cement is not classifiable as a human carcinogen.

OSHA/HCS status:	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Canadian (WHMIS):	Portland cement products are considered to be hazardous materials under the Hazardous Products Act as defined by the Controlled Products Regulations (CPR).
Classification of the substance or mixture:	SKIN CORROSION/IRRITATION — Category 1 SERIOUS EYE DAMAGE/ EYE IRRITATION — Category 1 SKIN SENSITIZATION — Category 1 CARCINOGENICITY/INHALATION — Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] — Category 3

GHS label elements

Hazard pictograms:



Signal word:	Danger
Hazard statements:	Causes severe skin burns and eye damage. May cause an allergic skin reaction. May cause respiratory irritation. May cause cancer.

Precautionary statements

Prevention:	Wear protective gloves. Wear eye or face protection. Use only outdoors or in a well-ventilated area. Avoid breathing dust. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Causes eye and skin burns. See Section 4 for additional details. May present risk of engulfment. See Section 7 for additional details. Overexposure to wet cement can cause severe skin damage in the form of chemical burns, including third degree burns. The same severe injury can occur if wet or moist skin is exposed to dry portland cement. Clothing wet with moisture from cement can transmit the caustic effects to the skin, causing chemical burns. Portland cement causes skin burns with little warning; discomfort or pain cannot be relied upon to alert a person to a serious injury. You may not feel pain or the severity of the burn until hours after the exposure. MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE: Contact with wet cement may aggravate existing skin conditions. Sensitivity to hexavalent chromium can be aggravated by exposure.
Response:	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Prolonged and repeated inhalation of respirable crystalline silica-containing dust in excess of appropriate exposure limits has caused silicosis, fibrosis or scar tissue formations in the lungs. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN: Wash with plenty of pH neutral soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: get medical attention. Portland cement may contain trace amounts of hexavalent chromium. Hexavalent chromium is associated with allergic skin reactions which may appear as contact dermatitis and skin ulcerations. Persons already sensitized may react to their first exposure to cement. Other individuals may develop allergic dermatitis after repeated exposure to cement. The symptoms of allergic reactions may include reddening of the skin, rash, and irritation. Symptoms of chronic exposure to wet cement may include reddening, irritation, and eczematous rashes. Drying, thickening, and cracking of the skin and nails may also occur. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Exposure to dust may cause immediate or delayed irritation or inflammation. Eye contact by larger amount of dry power or splashes of wet portland cement may cause effects ranging from moderate eye irritation to chemical burns or blindness. Immediately call a POISON CENTER or physician. IF INGESTED: Irritating to mouth, throat and stomach. Ingestion of large quantities may cause severe irritation and chemical burns of the mouth, throat, stomach and digestive tract. Do not ingest portland cement. Get immediate medical attention.
Storage:	Keep container tightly closed in a dry and well-ventilated area.
Disposal:	Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise classified:	Not applicable.

Section 3. Composition/information on ingredients

Substance/mixture:	Mixture
Chemical name:	Calcium compounds, calcium silicate compounds, and other calcium compounds containing iron and aluminum make up the majority of this product.
Other means of identification:	Cement, hydraulic cement, portland cement silicate

CAS number/other identifiers

CAS number: 65997-15-1

Product code: Not available.

Ingredient name	%	CAS number
Cement, portland chemicals	35 - 100	65997-15-1
The structure of portland cement may contain the following in some concentration ranges:		
Limestone	0 - 65	1317-65-3
Gypsum	2 - 10	13397-24-5
Hydrated Lime	0 - 50	1305-62-0
Cement Kiln Dust	0 - 15	68475-76-3
Iron Oxide	0 - 10	1309-37-1
Bentonite	0 - 10	1302-78-9
Magnesium oxide	0 - 4	1309-48-4
Calcium oxde	0 - 4	1305-78-8
Carbon Black	0 - 2	1333-66-4
Quartz	< 3	14808-60-7
Hexavalent chromium*	Trace	18450-29-9

Any concentration shown as a range is to protect confidentiality or is due to process variation.

*Hexavalent chromium is included due to dermal sensitivity associated with the component.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact: Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician.

Inhalation: Seek medical help if coughing or other symptoms persist. Inhalation of large amounts of portland cement requires immediate medical attention. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If the individual is not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact: Get medical attention immediately. Heavy exposure to portland cement dust, wet concrete or associated water requires prompt attention. Quickly remove contaminated clothing, shoes, and leather goods such as watchbands and belts. Quickly and gently blot or brush away excess portland cement. Immediately wash thoroughly with lukewarm, gently flowing water and non-abrasive pH neutral soap. Seek medical attention for rashes, burns, irritation, dermatitis and prolonged unprotected exposures to wet cement, cement mixtures or liquids from wet cement. Burns should be treated as caustic burns. Portland cement causes skin burns with little warning. Discomfort or pain cannot be relied upon to alert a person to a serious injury. You may not feel pain or the severity of the burn until hours after the exposure. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure.

Ingestion: Get medical attention immediately. Call a poison center or physician. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING unless directed to do so by medical personnel. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Have victim drink 60 to 240 mL (2 to 8 oz.) of water. Stop giving water if the exposed person feels sick as vomiting may be dangerous. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed potential acute health effects

Eye contact:	Causes serious eye damage.
Inhalation:	May cause respiratory irritation.
Skin contact:	Causes severe burns. May cause an allergic skin reaction.
Ingestion:	May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact:	Adverse symptoms may include the following: pain, watering and redness
Inhalation:	Adverse symptoms may include the following: respiratory tract irritation and coughing
Skin contact:	Adverse symptoms may include the following: pain or irritation, redness and blistering may occur, skin burns, ulceration and necrosis may occur
Ingestion:	Adverse symptoms may include the following: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician:	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments:	Not applicable.
Protection of first-aiders:	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media:	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media:	Do not use water jet or water-based fire extinguishers.
Specific hazards arising from the chemical:	No specific fire or explosion hazard.
Hazardous thermal decomposition products:	Decomposition products may include the following materials: carbon dioxide, carbon monoxide, sulfur oxides and metal oxide/oxides
Special protective actions for fire-fighters:	Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders:	For personal protective clothing requirements, please see Section 8.
Environmental precautions:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has entered the environment, including waterways, soil or air. Materials can enter waterways through drainage systems.

Methods and materials for containment and cleaning up

Small spill:	Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of waste material by using a licensed waste disposal contractor.
Large spill:	Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place dust in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Large spills to waterways may be hazardous due to alkalinity of the product. Dispose of waste material using a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures:	Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure by obtaining and following special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material and keep the container tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities:	A key to using the product safely requires the user to recognize that portland cement reacts chemically with water to produce calcium hydroxide which can cause severe chemical burns. Every attempt should be made to avoid skin and eye contact with cement. Do not get portland cement inside boots, shoes or gloves. Do not allow wet, saturated clothing to remain against the skin. Promptly remove clothing and shoes that are dusty or wet with cement mixtures. Launder/clean clothing and shoes before reuse. Do not enter a confined space that stores or contains portland cement unless appropriate procedures and protection are available. Portland cement can build up or adhere to the walls of a confined space and then release or fall suddenly (engulfment).

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Cement, portland, chemicals	ACGIH TLV (United States, 3/2012). TWA: 1 mg/m^3 8 hours. Form: Respirable fraction NIOSH REL (United States, 6/2009). TWA: 5 mg/m^3 10 hours. Form: Respirable fraction TWA: 10 mg/m^3 10 hours. Form: Total OSHA PEL (United States, 6/2010). TWA: 5 mg/m^3 8 hours. Form: Respirable fraction TWA: 15 mg/m^3 8 hours. Form: Total dust Exposure limits in Canada are under provincial jurisdictions.

Calcium oxide	ACGIH TLV (United States, 3/2012). TWA: 2 mg/m^3 8 hours. NIOSH REL (United States, 6/2009). TWA: 2 mg/m^3 10 hours. OSHA PEL (United States, 6/2010). TWA: 5 mg/m^3 8 hours. Exposure limits in Canada are under provincial jurisdictions.
Limestone	NIOSH REL (United States, 6/2009). TWA: 5 mg/m^3 10 hours. Form: Respirable fraction TWA: 10 mg/m^3 10 hours. Form: Total OSHA PEL (United States, 6/2010). TWA: 5 mg/m^3 8 hours. Form: Respirable fraction TWA: 15 mg/m^3 8 hours. Form: Total dust Exposure limits in Canada are under provincial jurisdictions.
Magnesium oxide	ACGIH TLV (United States, 3/2012). TWA: 10 mg/m^3 8 hours. Form: Inhalable fraction OSHA PEL (United States, 6/2010). TWA: 15 mg/m^3 8 hours. Form: Total particulates Exposure limits in Canada are under provincial jurisdictions.
Quartz	ACGIH TLV (United States, 3/2012). TWA: 0.025 mg/m^3 8 hours. Form: Respirable fraction NIOSH REL (United States, 6/2009). TWA: 0.05 mg/m^3 10 hours. Form: respirable dust OSHA PEL Z-3 (United States, 9/2005). TWA: 10mg/m^3 divided by %SiO_2 + 2: Respirable TWA: 30mg/m^3 divided by %SiO_2 + 2: Total Exposure limits in Canada are under provincial jurisdictions.
Calcium sulfate (gypsum)	ACGIH TLV (United States, 3/2012) TWA: 10 mg/m^3 8 hours. Form: Respirable fraction NIOSH REL (United States, 6/2009) TWA 5 mg/m^3 8 hours. Form: Respirable fraction TWA 10 mg/m^3 8 hours. Form: Total dust OSHA PEL Z-1 (United States, 2/2006) TWA 5 mg/m^3 8 hours. Form: Respirable fraction TWA 15 mg/m^3 8 hours. Form: Total dust Exposure limits in Canada are under provincial jurisdictions.

Appropriate engineering controls: Use only with adequate ventilation. If user operations generate dust, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures: Clean water should always be readily available for skin and (emergency) eye washing. Periodically wash areas contacted by portland cement with a pH neutral soap and clean, uncontaminated water. If clothing becomes saturated with portland cement, garments should be removed and replaced with clean, dry clothing.

Eye/face protection: To prevent eye contact, wear safety glasses with side shields, safety goggles or face shields when handling dust or wet cement. Wearing contact lenses when working with cement is not recommended.

Skin protection

Hand protection:	Use impervious, waterproof, abrasion and alkali-resistant gloves. Do not rely on barrier creams in place of impervious gloves. Do not get portland cement inside gloves.
Body protection:	Use impervious, waterproof, abrasion and alkali-resistant boots and protective long-sleeved and long-legged clothing to protect the skin from contact with wet portland cement. To reduce foot and ankle exposure, wear impervious boots that are high enough to prevent portland cement from getting inside them. Do not get portland cement inside boots, shoes, or gloves. Remove clothing and protective equipment that becomes saturated with cement and immediately wash exposed areas of the body.
Other skin protection:	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved. Footwear and other gear to protect the skin should be approved by a specialist before handling this product.
Respiratory protection:	Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product, and assigned protection factor of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical State:	Solid. [Powder.]	Lower and upper explosive (flammable) limits:	Not applicable.
Color:	Various (Gray or white).	Vapor pressure:	Not applicable.
Odor:	Odorless.	Vapor density:	Not applicable.
Odor threshold:	Not available.	Relative density:	2.3 to 3.1
pH:	>11.5 [Conc. (% w/w): 1%]	Solubility:	Slightly soluble in water.
Melting point:	Not available.	Solubility in water:	0.1 to 1%
Boiling point:	>1000°C (>1832°F)	Partition coefficient: n-octanol/water:	Not applicable.
Flash point:	Not flammable. Not combustible.	Auto-ignition temperature:	Not applicable.
Burning time:	Not available.	Decomposition temperature:	Not available.
Burning rate:	Not available.	SADT:	Not available.
Evaporation rate:	Not applicable.	Viscosity:	Not applicable.
Flammability (solid, gas):	Not applicable.		

Section 10. Stability and reactivity

Reactivity:	Reacts slowly with water forming hydrated compounds, releasing heat and producing a strong alkaline solution until reaction is substantially complete.
Chemical stability:	The product is stable.
Possibility of hazardous reactions:	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid:	No specific data.
Incompatible materials:	Reactive or incompatible with the following materials: oxidizing materials, acids, aluminum and ammonium salt. Portland cement is highly alkaline and will react with acids to produce a violent, heat-generating reaction. Toxic gases or vapors may be given off depending on the acid involved. Reacts with acids, aluminum metals and ammonium salts. Aluminum powder and other alkali and alkaline earth elements will react in wet mortar or concrete, liberating hydrogen gas. Limestone ignites on contact with fluorine and is incompatible with acids, alum, ammonium salts, and magnesium. Silica reacts violently with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride yielding possible fire and/or explosions. Silicates dissolve readily in hydrofluoric acid producing a corrosive gas — silicon tetrafluoride.
Hazardous decomposition products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity: Portland Cement LD50/LC50 = Not available

Irritation/Corrosion: Skin: May cause skin irritation. May cause serious burns in the presence of moisture.
Eyes: Causes serious eye damage. May cause burns in the presence of moisture.
Respiratory: May cause respiratory tract irritation.

Sensitization: May cause sensitization due to the potential presence of trace amounts of hexavalent chromium.

Mutagenicity: There are no data available.

Carcinogenicity:

Classification

Product/ingredient name	OSHA	IARC	ACGIH	NTP
Cement, portland, chemicals	—	—	A4	—
Quartz	—	1	A2	Known to be a human carcinogen.

Reproductive toxicity: There are no data available.

Teratogenicity: There are no data available.

Specific target organ toxicity (single exposure)

Name	Category	Route of Exposure	Target Organs
Calcium oxide	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation
Cement, portland, chemicals	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of Exposure	Target Organs
Quartz	Category 1	Inhalation	Respiratory tract and kidneys

Aspiration hazard: There are no data available.

Information on the likely routes of exposure

Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects: Eye contact: Causes serious eye damage.
Inhalation: May cause respiratory irritation.
Skin contact: Causes severe burns. May cause an allergic skin reaction.
Ingestion: May cause burns to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics:

Eye contact: Adverse symptoms may include the following: pain, watering, redness

Inhalation: Adverse symptoms may include the following: respiratory tract irritation, coughing

Skin contact: Adverse symptoms may include the following: pain or irritation, redness, blistering may occur, skin burns, ulcerations and necrosis may occur

Ingestion: Adverse symptoms may include the following: stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure:

Short term exposure
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.

Long term exposure
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.

Potential chronic health effects:

General: Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. If sensitized to hexavalent chromium, a severe allergic dermal reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: Portland cement is not classifiable as a human carcinogen. Crystalline silica is considered a hazard by inhalation. IARC has classified crystalline silica as a Group 1 substance, carcinogenic to humans. This classification is based on the findings of laboratory animal studies (inhalation and implantation) and epidemiology studies that were considered sufficient for carcinogenicity. Excessive exposure to crystalline silica can cause silicosis, a non-cancerous lung disease.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity:

Acute toxicity estimates: There are no data available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Calcium oxide	Chronic NOEC 100 mg/L Fresh water	Fish—Oreochromis niloticus—Juvenile (Fledgling, Hatchling, Weanling)	46 days

Persistence and degradability:

There are no data available.

Bioaccumulative potential:

There are no data available.

Mobility in soil:

Soil/water partition coefficient (Koc): Not available.

Other adverse effects:

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods:

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Untreated waste should not be released to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe manner. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff, and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	—	—	—
Transport hazard class(es)	—	—	—
Packing group	—	—	—
Environmental hazards	None.	None.	None.
Additional information	—	—	—

Portland Cement products are not considered hazardous under Transport Canada's Transportation of Dangerous Goods (TDG) regulations.

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available.

Section 15. Regulatory information

U.S. Federal regulations: TSCA 6 final risk management: Chromium, ion (Cr6+)

United States inventory (TSCA 8b): Portland cements are considered to be statutory mixtures under TSCA. CAS 65997-15-1 is included on the TSCA inventory.

Clean Water Act (CWA) 307: Chromium, ion (Cr6+)

CERCLA: This product is not listed as a CERCLA substance.

Clean Air Act Section 112 (b): Hazardous Air Pollutants (HAPs) — Not listed

Clean Air Act Section 602: Class I Substances — Not listed

Clean Air Act Section 602: Class II Substances — Not listed

DEA List I Chemicals: (Precursor Chemicals) — Not listed

DEA List II Chemicals: (Essential Chemicals) — Not listed

SARA 311/312

Classification: Immediate (acute) health hazard

Delayed (chronic) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Calcium oxide	A-B	No.	No.	No.	Yes.	No.
Quartz	< 0.2	No.	No.	No.	No.	Yes.
Chromium, ion (Cr6+)	< 0.1	No.	No.	No.	Yes.	Yes.
Nickel Compounds	< 0.1	No.	No.	No.	Yes.	Yes.
Lead (Organic & Inorganic)	< 0.1	No.	No.	No.	No.	Yes.

SARA 313

	Product name	CAS number	%
Form R—Reporting requirements	Chromium, ion (Cr6+) Lead (Organic or Inorganic) Nickel Compounds	8540-29-9 — —	< 0.1 < 0.1 < 0.1
Supplier notification	Alternatively, if any of the compounds are not present, state: This product does not contain any constituents listed under SARA Title III Section 313.		

Canada

WHMIS/DSL: Products containing crystalline silica and calcium carbonate are classified as D2A, E and are subject to WHMIS requirements.

State regulations

Massachusetts: The following components are listed: cement, portland, chemicals, limestone

New York: None of the components are listed.

New Jersey: The following components are listed: cement, portland, chemicals, gypsum, limestone

Pennsylvania: The following components are listed: cement, portland, chemicals, gypsum, limestone

California Prop. 65

WARNING: This product contains crystalline silica and chemicals (trace metals) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the above warning in the absence of definitive testing to prove the defined risks do not exist.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Quartz	Yes.	No.	No.	No.
Chromium, ion (Cr6+)	Yes.	Yes.	0.001 µg/day (inhalation)	8.2 micrograms/day (ingestion)
Nickel Compounds	No.	No.	No.	No.
Lead	Yes.	Yes.	15 µg/day (ingestion)	0.5 micrograms/day (inhalation)

International regulations

International lists: Canadian Domestic Substances List (DSL): Portland cement is included on the DSL.

Mexico Inventory (INSQ): All components are listed or exempted.

Section 16. Other information

History

Date of issue mm/dd/yyyy:	05/15/2015
Version:	1
Revised Section(s):	Not applicable.

Notice to reader

While the information provided in this safety data sheet is believed to provide a useful summary of the hazards of portland cement as it is commonly used, the sheet cannot anticipate and provide all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product. In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with portland cement to produce portland cement products. Users should review other relevant material safety data sheets before working with this portland cement or working on portland cement products, for example, portland cement concrete.

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY Essroc Cement Corp., except that the product shall conform to contracted specifications. The information provided herein was believed by the Essroc Cement Corp. to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

Abbreviations

ACGIH — American Conference of Governmental Industrial Hygienists

CAS — Chemical Abstract Service

CERCLA — Comprehensive Emergency Response and Comprehensive Liability Act

CFR — Code of Federal Regulations

DOT — Department of Transportation

GHS — Globally Harmonized System

HEPA — High Efficiency Particulate Air

IATA — International Air Transport Association

IARC — International Agency for Research on Cancer

IMDG — International Maritime Dangerous Goods

NIOSH — National Institute of Occupational Safety and Health

NOEC — No Observed Effect Concentration

NTP — National Toxicology Program

OSHA — Occupational Safety and Health Administration

PEL — Permissible Exposure Limit

REL — Recommended Exposure Limit

RQ — Reportable Quantity

SARA — Superfund Amendments and Reauthorization Act

SDS — Safety Data Sheet

TLV — Threshold Limit Value

TPQ — Threshold Planning Quantity

TSCA — Toxic Substances Control Act

TWA — Time-Weighted Average

UN — United Nations

Safety Data Sheet

RUST-OLEUM CORPORATION
* Trusted Quality Since 1921 *
www.rustoleum.com

1. Identification

Product Name: SPECLT SSPR 6PK FLUOR ORANGE

Revision Date: 5/15/2015

Product Identifier: 1954830

Supercedes Date: New SDS

Product Use/Class: Topcoat/Aerosol

Supplier: Rust-Oleum Corporation
11 Hawthorn Parkway
Vernon Hills, IL 60061
USA

Manufacturer: Rust-Oleum Corporation
11 Hawthorn Parkway
Vernon Hills, IL 60061
USA

Preparer: Regulatory Department

Emergency Telephone: 24 Hour Hotline: 847-367-7700

2. Hazard Identification

EMERGENCY OVERVIEW: Harmful if swallowed. Extremely flammable liquid and vapor. Vapors may cause flash fire or explosion. Contents Under Pressure. Harmful if inhaled. May affect the brain or nervous system causing dizziness, headache or nausea. May cause eye, skin, or respiratory tract irritation. KEEP OUT OF REACH OF CHILDREN. Harmful if inhaled. Causes eye irritation. Use ventilation necessary to keep exposures below recommended exposure limits, if any. Vapor Harmful. Causes Eye, Skin, Nose, and Throat Irritation.

Classification

Symbol(s) of Product



Signal Word
Danger

Possible Hazards
64% of the mixture consists of ingredient(s) of unknown acute toxicity

GHS HAZARD STATEMENTS

Flammable Aerosol, category 1	H222	Extremely flammable aerosol.
Flammable Liquid, category 1	H224	Extremely flammable liquid and vapor.
Acute Toxicity, Oral, category 5	H303	May be harmful if swallowed.
Acute Toxicity, Dermal, category 5	H313	May be harmful in contact with skin.
Skin Irritation, category 2	H315	Causes skin irritation.
Eye Irritation, category 2	H319	Causes serious eye irritation.
Acute Toxicity, Inhalation, category 4	H332	Harmful if inhaled.
STOT, single exposure, category 3, RTI	H335	May cause respiratory irritation.
STOT, single exposure, category 3, NE	H336	May cause drowsiness or dizziness.
Aspiration Hazard, category 2	H305	May be harmful if swallowed and enters airways.
Eye Irritation, category 2B	H320	Causes eye irritation.
Flammable Aerosol, category 1	H280	Contains gas under pressure; may explode if heated.

Germ Cell Mutagenicity, category 1B	H340	May cause genetic defects. Classified as mutagenic Category 1 if one ingredient is present at or above 0.1%. Applies to liquids, solids (w/w units) and gases (v/v). The substance may also have its own exposure limit. Routes of exposure are dependent on ingredient form.
Carcinogenicity, category 1B	H350	May cause cancer. Classified as carcinogenic Category 1 on the basis of epidemiological and/or animal data. Mixtures are classified as carcinogenic when at least 1 ingredient has been classified as carcinogenic and is present at 0.1% or above Routes of exposure are dependant on ingredient form.
Reproductive Toxicity, category 2	H361	Suspected of damaging fertility or the unborn child. Classifed Category 2 suspected human reproductive toxicant irreversible effects such as structural malfunctions, embryo/foetal lethality, post natal functional deficiencies.
STOT, repeated exposure, category 2	H373	May cause damage to organs <or state all organs affected, if known> through prolonged or repeated exposure <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
Acute Toxicity, Oral, category 4	H302	Harmful if swallowed.

GHS LABEL PRECAUTIONARY STATEMENTS

P211	Do not spray on an open flame or other ignition source.
P251	Pressurized container: Do not pierce or burn, even after use.
P375	Fight fire remotely due to the risk of explosion.
P102	Keep out of reach of children.
P103	Read label before use.
P234	Keep only in original container.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P262	Do not get in eyes, on skin, or on clothing.
P264	Wash … thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P285	In case of inadequate ventilation wear respiratory protection.
P374	Fight fire with normal precautions from a reasonable distance.
P402	Store in a dry place.
P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P410+P412	Protect from sunlight. Do not expose to temperatures exceeding 50°C / 122°F.
P403+P235	Store in a well-ventilated place. Keep cool.
P362	Take off contaminated clothing and wash before reuse.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P201	Obtain special instructions before use.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P350	Gently wash with plenty of soap and water.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.

3. Composition/Information On Ingredients

HAZARDOUS SUBSTANCES

Chemical Name	CAS-No.	Wt.% Range	GHS Symbols	GHS Statements
Aliphatic Hydrocarbon	64742-89-8	10-25	GHS08	H340-350
Propane	74-98-6	10-25		
Toluene	108-88-3	10-25	GHS02-GHS07-GHS08	H225-302-332-361-336-373-315
n-Butane	106-97-8	2.5-10		
Limestone	1317-65-3	2.5-10		

Hydrous Magnesium Silicate	14807-96-6	2.5-10		
Hydrotreated Light Distillate	64742-47-8	2.5-10	GHS06	H331
Naphtha, Petroleum, Hydrotreated Light	64742-49-0	2.5-10	GHS08	H340-350
Barium Sulfate	7727-43-7	2.5-10		
Organoclay	68911-87-5	1.0-2.5		
Ethylbenzene	100-41-4	0.1-1.0	GHS02-GHS07	H225-332

The text for GHS Hazard Statements shown above (if any) is given in the "16. Other Information" section.

4. First-aid Measures

FIRST AID - EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes holding eyelids open. Get medical attention. Do NOT allow rubbing of eyes or keeping eyes closed.

FIRST AID - SKIN CONTACT: Wash skin with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

FIRST AID - INHALATION: If you experience difficulty in breathing, leave the area to obtain fresh air. If continued difficulty is experienced, get medical assistance immediately. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention. Do NOT use mouth-to-mouth resuscitation.

FIRST AID - INGESTION: Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. Get immediate medical attention. If swallowed, get medical attention.

5. Fire-fighting Measures

EXTINGUISHING MEDIA: Alcohol Film Forming Foam, Carbon Dioxide, Dry Chemical, Dry Sand, Water Fog

UNUSUAL FIRE AND EXPLOSION HAZARDS: FLASH POINT IS LESS THAN 20°F. EXTREMELY FLAMMABLE LIQUID AND VAPOR!Water spray may be ineffective. Closed containers may explode when exposed to extreme heat. Vapors may form explosive mixtures with air. Vapors can travel to a source of ignition and flash back. Keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flame. Perforation of the pressurized container may cause bursting of the can. Closed containers may explode when exposed to extreme heat due to buildup of steam. No unusual fire or explosion hazards noted.

SPECIAL FIREFIGHTING PROCEDURES: Evacuate area and fight fire from a safe distance. Full protective equipment including self-contained breathing apparatus should be used. Water may be used to cool closed containers to prevent pressure buildup and possible autoignition or explosion. Use water spray to keep fire-exposed containers cool. Containers may explode when heated.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Contain spilled liquid with sand or earth. DO NOT use combustible materials such as sawdust. Remove all sources of ignition, ventilate area and remove with inert absorbent and non-sparking tools. Dispose of according to local, state (provincial) and federal regulations. Do not incinerate closed containers. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Ventilate area, isolate spilled material, and remove with inert absorbent. Dispose of contaminated absorbent, container, and unused contents in accordance with local, state, and federal regulations.

7. Handling and Storage

HANDLING: Wash thoroughly after handling. Wash hands before eating. Use only in a well-ventilated area. Follow all MSDS/label precautions even after container is emptied because it may retain product residues. Avoid breathing fumes, vapors, or mist. Remove contaminated clothing and launder before reuse. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing.

STORAGE: Keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flame. Contents under pressure. Do not store above 120 ° F. Store large quantities in buildings designed and protected for storage of NFPA Class I flammable liquids. Contents under pressure. Do not expose to heat or store above 120 ° F. Product should be stored in tightly sealed containers and protected from heat, moisture, and foreign materials. Store in a dry, well ventilated place. Keep container tightly closed when not in use. Keep away from heat, sparks, flame and sources of ignition. Avoid excess heat.

8. Exposure Controls/Personal Protection

Chemical Name	CAS-No.	Weight % Less Than	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-CEILING
Aliphatic Hydrocarbon	64742-89-8	25.0	350 ppm	N.E.	500 ppm	N.E.
Propane	74-98-6	20.0	1000 ppm	N.E.	1000 ppm	N.E.

Toluene	108-88-3	15.0	20 ppm	N.E.	200 ppm	300 ppm
n-Butane	106-97-8	10.0	1000 ppm	1000 ppm	N.E.	N.E.
Limestone	1317-65-3	10.0	15 mg/m3 (Total Dust, OSHA)	N.E.	5 mg/m3 (Respirable Dust)	N.E.
Hydrous Magnesium Silicate	14807-96-6	5.0	2 mg/m3 (Respirable Dust)	N.E.	20 mppcf (Mineral Dust <1% Quartz)	N.E.
Hydrotreated Light Distillate	64742-47-8	5.0	100 ppm	N.E.	500 ppm	N.E.
Naphtha, Petroleum, Hydrotreated Light	64742-49-0	5.0	200 mg/m3	N.E.	N.E.	N.E.
Barium Sulfate	7727-43-7	5.0	5 mg/m3 (Inhlalable fraction w/o asbestos and <1% cryst.silica)	N.E.	15 mg/m3 [Total Dust]	N.E.
Organoclay	68911-87-5	5.0	N.E.	N.E.	N.E.	N.E.
Ethylbenzene	100-41-4	1.0	20 ppm	125 ppm	100 ppm	N.E.

PERSONAL PROTECTION

ENGINEERING CONTROLS: Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof ventilation equipment. Prevent build-up of vapors by opening all doors and windows to achieve cross-ventilation. Provide general dilution of local exhaust ventilation in volume and pattern to keep TLV of hazardous ingredients below acceptable limits.

RESPIRATORY PROTECTION: A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. A NIOSH/MSHA approved air purifying respirator with organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits.

SKIN PROTECTION: Use impervious gloves to prevent skin contact and absorption of this material through the skin. Nitrile or Neoprene gloves may afford adequate skin protection. Use gloves to prevent prolonged skin contact.

EYE PROTECTION: Use safety eyewear designed to protect against splash of liquids.

OTHER PROTECTIVE EQUIPMENT: Refer to safety supervisor or industrial hygienist for further information regarding personal protective equipment and its application. Refer to safety supervisor or industrial hygienist for further guidance regarding types of personal protective equipment and their applications.

HYGIENIC PRACTICES: Wash thoroughly with soap and water before eating, drinking or smoking. Remove contaminated clothing immediately and launder before reuse.

9. Physical and Chemical Properties

Appearance:	Aerosolized Mist	**Physical State:**	Liquid
Odor:	Solvent Like	**Odor Threshold:**	ND
Relative Density:	0.807	**pH:**	N.D.
Freeze Point, °C:	ND	**Viscosity:**	N.D.
Solubility in Water:	Slight	**Partition Coefficient, n-octanol/water:**	No Information
Decompostion Temp., °C:	No Information		
Boiling Range, °C:	-11 - 999	**Explosive Limits, vol%:**	0.9 - 14.3
Flammability:	Does not Support Combustion	**Flash Point, °C:**	-105
Evaporation Rate:	Faster than Ether	**Auto-ignition Temp., °C:**	No Information
Vapor Density:	Heavier than Air	**Vapor Pressure:**	ND

(See "Other information" Section for abbreviation legend)

10. Stability and Reactivity

CONDITIONS TO AVOID: Avoid temperatures above 120 ° F. Avoid all possible sources of ignition. Avoid contact with strong acid and strong bases.

INCOMPATIBILITY: Incompatible with strong oxidizing agents, strong acids and strong alkalies.

HAZARDOUS DECOMPOSITION: By open flame, carbon monoxide and carbon dioxide. When heated to decomposition, it emits acrid smoke and irritating fumes. Contains solvents which may form carbon monoxide, carbon dioxide, and formaldehyde.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

11. Toxicological information

EFFECTS OF OVEREXPOSURE - EYE CONTACT: Causes Serious Eye Irritation

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: May be absorbed through the skin in harmful amounts. Substance may cause slight skin irritation. Prolonged or repeated contact may cause skin irritation. May cause skin irritation. Allergic reactions are possible.

EFFECTS OF OVEREXPOSURE - INHALATION: Harmful if inhaled. High gas, vapor, mist or dust concentrations may be harmful if inhaled. Avoid breathing fumes, spray, vapors, or mist. High vapor concentrations are irritating to the eyes, nose, throat and lungs. Prolonged or excessive inhalation may cause respiratory tract irritation.

EFFECTS OF OVEREXPOSURE - INGESTION: Aspiration hazard if swallowed; can enter lungs and cause damage. Harmful if swallowed.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: IARC lists Ethylbenzene as a possible human carcinogen (group 2B). May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion, and blurred vision) and/or damage. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. High concentrations may lead to central nervous system effects (drowsiness, dizziness, nausea, headaches, paralysis, and blurred vision) and/or damage.

PRIMARY ROUTE(S) OF ENTRY: Eye Contact, Ingestion, Inhalation, Skin Absorption, Skin Contact

ACUTE TOXICITY VALUES

The acute effects of this product have not been tested. Data on individual components are tabulated below:

CAS-No.	Chemical Name	Oral LD50	Dermal LD50	Vapor LC50
64742-89-8	Aliphatic Hydrocarbon	N.I.	3000 mg/kg Rabbit	N.I.
74-98-6	Propane	N.I.	N.I.	658 mg/L Rat
108-88-3	Toluene	636 mg/kg Rat	8390 mg/kg Rabbit	12.5 mg/L Rat
64742-47-8	Hydrotreated Light Distillate	>5000 mg/kg Rat	>2000 mg/kg Rabbit	>5.2 mg/L Rat
64742-49-0	Naphtha, Petroleum, Hydrotreated Light	>5000 mg/kg Rat	>3160 mg/kg Rabbit	N.I.
100-41-4	Ethylbenzene	3500 mg/kg Rat	15354 mg/kg Rabbit	17.2 mg/L Rat

N.I. - No Information

12. Ecological Information

ECOLOGICAL INFORMATION: Product is a mixture of listed components. Product is a mixture of listed components.

13. Disposal Information

DISPOSAL INFORMATION: Dispose of material in accordance to local, state, and federal regulations and ordinances. Do not allow to enter waterways, wastewater, soil, storm drains or sewer systems.

14. Transport Information

	Domestic (USDOT)	International (IMDG)	Air (IATA)	TDG (Canada)
UN Number:	1263	1263	1263	1263
Proper Shipping Name:	Paint	Paint	Paint	Paint
Hazard Class:	3	3	3	3
Packing Group:	II	II	II	II
Limited Quantity:	No	No	No	No

15. Regulatory Information

U.S. Federal Regulations:

CERCLA - SARA Hazard Category

This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Fire Hazard, Pressure Hazard, Acute Health Hazard, Chronic Health Hazard

Sara Section 313:

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372:

Chemical Name	CAS-No.
Toluene	108-88-3
Ethylbenzene	100-41-4

Toxic Substances Control Act:

This product contains the following chemical substances subject to the reporting requirements of TSCA 12(b) if exported from the United States:

No TSCA 12(b) components exist in this product.

CALIFORNIA PROPOSITION 65:

WARNING: This product contains a substance known to the State of California to cause cancer.

Chemical Name	CAS-No.
Ethylbenzene	100-41-4
Crystalline Silica / Quartz	14808-60-7
Cristobalite	14464-46-1
Benzene	71-43-2
Formaldehyde	50-00-0
Lead Compounds	7439-92-1
Cadmium Compounds	7440-43-9

CALIFORNIA PROPOSITION 65 REPRODUCTIVE TOXINS

WARNING: This product contains a substance known to the State of California to cause birth defects or other reproductive harm.

Chemical Name	CAS-No.
Toluene	108-88-3
Benzene	71-43-2
Cadmium Compounds	7440-43-9
Lead Compounds	7439-92-1

International Regulations:

CANADIAN WHMIS:

This SDS has been prepared in compliance with Controlled Product Regulations except for the use of the 16 headings.

16. Other Information

HMIS RATINGS

Health:	2*	**Flammability:**	4	**Physical Hazard:**	0	**Personal Protection:**	X

CANADIAN WHMIS CLASS: AB5 D2A

NFPA RATINGS

Health:	2	**Flammability:**	4	**Instability**	0

VOLATILE ORGANIC COMPOUNDS, g/L: 589

MSDS REVISION DATE: 5/15/2015

REASON FOR REVISION: No Information

Legend: N.A. - Not Applicable, N.E. - Not Established, N.D. - Not Determined

Text for GHS Hazard Statements shown in Section 3 describing each ingredient:

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H315	Causes skin irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H350	May cause cancer <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H361	Suspected of damaging fertility or the unborn child. Classifed Category 2 suspected human reproductive toxicant irreversible effects such as structural malfunctions, embryo/foetal lethality, post natal functional deficiencies.
H373	May cause damage to organs <or state all organs affected, if known> through prolonged or repeated exposure <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.

Icons for GHS Pictograms shown in Section 3 describing each ingredient:

GHS02



GHS06



GHS07



GHS08



Rust-Oleum Corporation believes, to the best of its knowledge, information and belief, the information contained herein to be accurate and reliable as of the date of this safety data sheet. However, because the conditions of handling, use, and storage of these materials are beyond our control, we assume no responsibility or liability for personal injury or property damage incurred by the use of these materials. Rust-Oleum Corporation makes no warranty, expressed or implied, regarding the accuracy or reliability of the data or results obtained from their use. All materials may present unknown hazards and should be used with caution. The information and recommendations in this material safety data sheet are offered for the users' consideration and examination. It is the responsibility of the user to determine the final suitability of this information and to comply with all applicable international, federal, state, and local laws and regulations.

SAFETY DATA SHEET

Version 5.12
Revision Date 09/23/2016
Print Date 11/07/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Sulfuric acid

Product Number : 339741
Brand : Aldrich
Index-No. : 016-020-00-8

CAS-No. : 7664-93-9

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Corrosive to metals (Category 1), H290
Skin corrosion (Category 1A), H314
Serious eye damage (Category 1), H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.

Precautionary statement(s)
P234 Keep only in original container.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.
P405	Store locked up.
P406	Store in corrosive resistant stainless steel container with a resistant inner liner.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	H_2O_4S
Molecular weight	:	98.08 g/mol
CAS-No.	:	7664-93-9
EC-No.	:	231-639-5
Index-No.	:	016-020-00-8
Registration number	:	01-2119458838-20-XXXX

Hazardous components

Component	Classification	Concentration
Sulfuric acid		
	Met. Corr. 1; Skin Corr. 1A; Eye Dam. 1; H290, H314	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Sulfuric acid	7664-93-9	TWA	0.2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	1 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants

Derived No Effect Level (DNEL)

Application Area	Exposure routes	Health effect	Value
Workers	Inhalation	Acute local effects	0.1 mg/m3
Workers	Inhalation	Long-term local effects	0.05 mg/m3

Predicted No Effect Concentration (PNEC)

Compartment	Value
Marine water	0.00025 mg/l
Fresh water	0.0025 mg/l
Marine sediment	0.002 mg/kg

Fresh water sediment	0.002 mg/kg
Onsite sewage treatment plant	8.8 mg/l

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 30 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: clear, liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	1.2 at 5 g/l
e)	Melting point/freezing point	3 °C (37 °F)
f)	Initial boiling point and boiling range	290 °C (554 °F) - lit.

g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	1.33 hPa (1.00 mmHg) at 145.8 °C (294.4 °F)
l)	Vapour density	3.39 - (Air = 1.0)
m)	Relative density	1.84 g/cm3 at 25 °C (77 °F)
n)	Water solubility	soluble
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	55.1 mN/m at 20 °C (68 °F)
Relative vapour density	3.39 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Bases, Halides, Organic materials, Carbides, fulminates, Nitrates, picrates, Cyanides, Chlorates, alkali halides, Zinc salts, permanganates, e.g. potassium permanganate, Hydrogen peroxide, Azides, Perchlorates., Nitromethane, phosphorous, Reacts violently with:, cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phosphorous(III) oxide, Powdered metals

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Sulphur oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 2,140 mg/kg

LC50 Inhalation - Rat - 2 h - 510 mg/m3

Dermal: No data available

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Extremely corrosive and destructive to tissue.

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Corrosive to eyes

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

The International Agency for Research on Cancer (IARC) has determined that occupational exposure to strong-inorganic-acid mists containing sulfuric acid is carcinogenic to humans (group 1).

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: WS5600000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Pulmonary edema. Effects may be delayed., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Gambusia affinis (Mosquito fish) - 42 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 29 mg/l - 24 h

12.2 Persistence and degradability
The methods for determining the biological degradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1830 Class: 8 Packing group: II
Proper shipping name: Sulfuric acid
Reportable Quantity (RQ): 1000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1830 Class: 8 Packing group: II EMS-No: F-A, S-B
Proper shipping name: SULPHURIC ACID

IATA
UN number: 1830 Class: 8 Packing group: II
Proper shipping name: Sulphuric acid

15. REGULATORY INFORMATION

SARA 302 Components
The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Sulfuric acid	7664-93-9	2007-07-01

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Sulfuric acid	7664-93-9	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Sulfuric acid	7664-93-9	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Sulfuric acid	7664-93-9	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Sulfuric acid	7664-93-9	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer.	7664-93-9	2007-09-28

Sulfuric acid

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Eye Dam.	Serious eye damage
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
Met. Corr.	Corrosive to metals

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.12 Revision Date: 09/23/2016 Print Date: 11/07/2016

SAFETY DATA SHEET

Version 5.8
Revision Date 09/23/2016
Print Date 11/14/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Toluene

Product Number : 89680
Brand : Sigma-Aldrich
Index-No. : 601-021-00-3

CAS-No. : 108-88-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Specific target organ toxicity - repeated exposure (Category 2), H373
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 2), H401

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H361 Suspected of damaging fertility or the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.
H401 Toxic to aquatic life.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C_7H_8
Molecular weight	:	92.14 g/mol
CAS-No.	:	108-88-3
EC-No.	:	203-625-9
Index-No.	:	601-021-00-3
Registration number	:	01-2119471310-51-XXXX

Hazardous components

Component	Classification	Concentration
Toluene		
	Flam. Liq. 2; Skin Irrit. 2; Repr. 2; STOT SE 3; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; H225, H304, H315, H336, H361, H373, H401	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Toluene	108-88-3	TWA	100 ppm 375 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		STEL	150 ppm 560 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	200 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
	Remarks	Z37.12-1967		
		CEIL	300 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.12-1967		
		Peak	500 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.12-1967		
		TWA	20 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Visual impairment Female reproductive Pregnancy loss 2015 Adoption Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	100 ppm 375 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	150 ppm 560 mg/m3	USA. NIOSH Recommended Exposure Limits

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Toluene	108-88-3	Toluene	0.0200 mg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Prior to last shift of workweek			
		Toluene	0.0300 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			
		o-Cresol	0.3000 mg/g	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	aromatic
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -93 °C (-135 °F)
f)	Initial boiling point and boiling range	110 - 111 °C (230 - 232 °F)
g)	Flash point	4.0 °C (39.2 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 7 %(V) Lower explosion limit: 1.2 %(V)
k)	Vapour pressure	29.1 hPa (21.8 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available

m)	Relative density	0.865 g/mL at 25 °C (77 °F)
n)	Water solubility	0.5 g/l at 15 °C (59 °F)
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	535.0 °C (995.0 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - > 5,580 mg/kg

LC50 Inhalation - Rat - 4 h - 12,500 - 28,800 mg/m3

LD50 Dermal - Rabbit - 12,196 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Rat
Liver
DNA damage

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
Damage to fetus possible
Suspected human reproductive toxicant

Reproductive toxicity - Rat - Inhalation
Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count).

Experiments have shown reproductive toxicity effects in male and female laboratory animals.

Developmental Toxicity - Rat - Oral
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: XS5250000

Lung irritation, chest pain, pulmonary edema, Inhalation studies on toluene have demonstrated the development of inflammatory and ulcerous lesions of the penis, prepuce, and scrotum in animals., Central nervous system

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 7.63 mg/l - 96 h
	NOEC - Pimephales promelas (fathead minnow) - 5.44 mg/l - 7 d
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 8.00 mg/l - 24 h
	Immobilization EC50 - Daphnia magna (Water flea) - 6 mg/l - 48 h
Toxicity to algae	EC50 - Chlorella vulgaris (Fresh water algae) - 245.00 mg/l - 24 h
	EC50 - Pseudokirchneriella subcapitata (green algae) - 10.00 mg/l - 24 h

12.2 Persistence and degradability

Biodegradability Result: - Readily biodegradable

12.3 Bioaccumulative potential

Bioaccumulation Leuciscus idus (Golden orfe) - 3 d
- 0.05 mg/l

Bioconcentration factor (BCF): 90

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1294 Class: 3 Packing group: II
Proper shipping name: Toluene
Reportable Quantity (RQ): 1000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1294 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: TOLUENE

IATA
UN number: 1294 Class: 3 Packing group: II
Proper shipping name: Toluene

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Toluene	108-88-3	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Toluene	108-88-3	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Toluene	108-88-3	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Toluene	108-88-3	2007-07-01

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive	CAS-No. 108-88-3	Revision Date 2009-02-01

harm.
Toluene

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H401	Toxic to aquatic life.
Repr.	Reproductive toxicity
Skin Irrit.	Skin irritation

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.8 Revision Date: 09/23/2016 Print Date: 11/14/2016

SAFETY DATA SHEET

Version 5.9
Revision Date 05/24/2016
Print Date 11/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Xylenes

Product Number : 214736
Brand : Aldrich
Index-No. : 601-022-00-9

CAS-No. : 1330-20-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 3), H226
Acute toxicity, Inhalation (Category 4), H332
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Central nervous system, Liver, Kidney, H373
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 2), H401

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H226 Flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.

H335	May cause respiratory irritation.
H373	May cause damage to organs (Central nervous system, Liver, Kidney) through prolonged or repeated exposure if inhaled.
H401	Toxic to aquatic life.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314	Get medical advice/ attention if you feel unwell.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Xylene mixture of isomers
Formula	:	C_8H_{10}
Molecular weight	:	106.17 g/mol
CAS-No.	:	1330-20-7
EC-No.	:	215-535-7
Index-No.	:	601-022-00-9

Hazardous components

Component	Classification	Concentration
Xylene		
	Flam. Liq. 3; Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2A; STOT SE 3; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; H226, H304, H315, H319, H332, H335, H373, H401	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Xylene	1330-20-7	TWA	100.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Eye & Upper Respiratory Tract irritation Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	150.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Eye & Upper Respiratory Tract irritation Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	100.000000 ppm 435.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	100.000000 ppm 435.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	100.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	150.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		

		TWA	100 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	150 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	100 ppm 435 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		STEL	150 ppm 655 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	300 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	100 ppm 435 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Xylene	1330-20-7	Methylhippuric acids	1,500.0000 mg/g	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		Methylhippuric acids	1,500.0000 mg/g	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min

Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 35 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: clear, liquid Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	< 0 °C (< 32 °F)
f)	Initial boiling point and boiling range	137 - 140 °C (279 - 284 °F) - lit.
g)	Flash point	25 °C (77 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 7 %(V) Lower explosion limit: 1.1 %(V)
k)	Vapour pressure	24 hPa (18 mmHg) at 37.70 °C (99.86 °F)
l)	Vapour density	3.67 - (Air = 1.0)
m)	Relative density	0.86 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available

q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density 3.67 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 3,523 mg/kg

LC50 Inhalation - Rat - 4 h - 5000 ppm

LD50 Dermal - Rabbit - 12,126 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Moderate eye irritation

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	3 - Group 3: Not classifiable as to its carcinogenicity to humans (Xylene)
IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
May cause respiratory irritation.

Specific target organ toxicity - repeated exposure
Inhalation - May cause damage to organs through prolonged or repeated exposure. - Central nervous system, Liver, Kidney

Aspiration hazard
May be fatal if swallowed and enters airways.

Additional Information
RTECS: Not available

Blurred vision, Incoordination., Headache, Nausea, Vomiting, Dizziness, Weakness, anemia, Prolonged or repeated exposure to skin causes defatting and dermatitis.
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 3.3 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 75.49 mg/l - 24 h
Toxicity to algae	Growth inhibition EC50 - Pseudokirchneriella subcapitata - 72 mg/l - 14 d

12.2 Persistence and degradability

Biodegradability	Result: - Readily biodegradable

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1307 Class: 3 Packing group: III
Proper shipping name: Xylenes
Reportable Quantity (RQ): 100 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1307 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: XYLENES

IATA
UN number: 1307 Class: 3 Packing group: III
Proper shipping name: Xylenes

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Asp. Tox.	Aspiration hazard
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H373	May cause damage to organs (/$/*_2ORG_REP_INH/$/) through prolonged or repeated exposure if inhaled.
H401	Toxic to aquatic life.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.9 Revision Date: 05/24/2016 Print Date: 11/13/2016

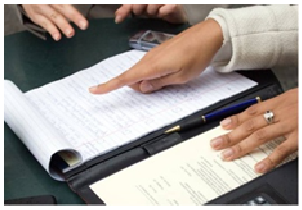
APPENDIX G

Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN







Remedial Investigation
BMS Syracuse North Campus Restoration Area
East Syracuse, New York
Site No. C734138

Bristol-Myers Squibb Company

March 2013

O'BRIEN & GERE

TABLE OF CONTENTS

List of Tables ..... **iv**
Distribution List ..... **iv**
List of Acronyms/Abbreviations ..... **v**
1. Introduction 1
2. Project Background and Scope 3
2.1 Project Background 3
2.2 Project Scope 3
2.2.1 Laboratory Analysis 3
2.2.2 Data Validation 3
2.2.3 Audits 4
2.2.4 Documentation 4
3. Data Quality Objectives and Criteria 5
3.1 DQO Process 5
3.2 Analytical levels 6
3.3 Field Sampling Objectives 7
3.4 Laboratory Objectives 7
4. Project Organization and Responsibility 9
4.1 Regulatory Agency 9
4.2 BMS Project Manager 9
4.3 Consultant Key Personnel 9
4.3.1 Project Officer 9
4.3.2 Project Manager 9
4.3.3 Quality Assurance Officer 9
4.3.4 Data Validator 9
4.3.5 Field Team Leader 9
4.3.6 Field Sampling Personnel 9
4.4 Laboratory Management 10
4.4.1 Laboratory Project Manager 10
4.4.2 Laboratory Quality Assurance Manager 10
4.4.3 Laboratory Sample Management Supervisors 10
5. Special Training Requirements 11
6. Documentation 13
7. Sampling Design and Method Requirements 15
7.1 Sampling Network 15
7.2 Sample Locations and Designations 15
7.3. Sampling Procedures 15
7.3.1 Soil Vapor Sampling Procedure 15
7.3.2 Field Duplicate Sampling Procedure 15

7.3.3 Matrix Spike/Matrix Spike Duplicate Sampling Procedure 15
7.3.4 Field/Equipment Blank Sampling Procedure 16
7.3.5 Trip Blank Procedure 16
7.4 Decontamination of Sampling Equipment 16
8. Sample Handling and Custody 17
8.1 Sample Custody and Procedures 17
8.2 Sample Preparation 17
8.3 Field Custody Procedures 17
8.4 Chain of Custody Procedures 18
8.5 Laboratory Chain of Custody Procedures 20
8.6 Final Evidence Files 21
9. Analytical Method Requirements 23
9.1 Analytical Methods 23
9.2 Detection Limits 23
10. Laboratory QA/QC Procedures 25
10.1 GC/MS Tuning 25
10.2 Calibration 25
10.3 Blanks 25
10.4 Internal Standards Performance 25
10.5 Surrogate Evaluation 25
10.6 Laboratory Control Samples or Matrix Spike Blanks 26
10.7 MS/MSD and Laboratory Duplicate Samples 26
10.8 Analyte Identification and Quantitation 26
10.9 Corrective Action 26
10.10 Control Limits 27
10.11 Preventative Maintenance 27
10.12 Data Assessment Procedures 27
11. Field QA/QC Procedures 29
11.1 Field Duplicate Samples 29
11.2 MS/MSD and Duplicate Samples 29
11.3 Field/EQUIPMENT Blanks 29
11.4 Trip Blanks 29
11.5 Temperature Blanks 30
12. Instrument/Equipment Testing and Maintenance 31
13. Calibration and Frequency 33
13.1 Field Equipment Calibration 33
13.2 Laboratory Equipment Calibration 33
13.2.1 Organics 33
13.2.2 Metals and Inorganics 33
13.2.3 Thermometers 34

13.3 Standards and Solutions 34
13.4. Calibration Records 34
14. Inspection Requirements for Supplies 35
15. Data Acquisition Requirements 37
16. Data Deliverables 39
17. Assessment and Response Actions 41
17.1 Performance and Systems Audits 41
17.1.1 Performance Audits 41
17.1.2 Laboratory Audit Protocol 41
17.1.3 Field Audit Protocol 41
17.2 System Audits 42
17.3 Corrective Actions 42
18. QA Reports to Management 43
19. Data Review and Management 45
19.1 Data Production, Handling, and Reporting 45
19.1.1 Laboratory Documents 45
19.1.2 Data Reduction 45
19.1.3 Laboratory Data Review 45
19.1.4 Data Management 46
20. Data Validation and Usability 47
20.1 Scope of Validation 47
20.2 Validation Procedures 47
20.3 Data Usability Evaluation 49
20.4 Data Usability Summary Report 50
21. Reconciliation with User Requirements 51
References 53

LIST OF TABLES

1 Field sampling summary

2-1A Laboratory detection limits and regulatory criteria for VOCs

2-1B Laboratory detection limits and regulatory criteria for VOCs in soil vapor

2-2 Laboratory detection limits and regulatory criteria for SVOCs

2-3 Laboratory detection limits and regulatory criteria for PCBs, organochlorine pesticides

2-4 Laboratory detection limits and regulatory criteria for metals and inorganics

3-1A VOCs quality control requirements and corrective actions

3-1B VOCs soil vapor quality control requirements and corrective actions

3-1C VOCs using USEPA method 624 quality control requirements and corrective actions

3-2 SVOCs quality control requirements and corrective actions

3-3 PCBs quality control requirements and corrective actions

3-4 Organochlorine pesticides quality control requirements and corrective actions

3-5 Metals, mercury, and total cyanide quality control requirements and corrective actions

3-6 Glycols quality control requirements and corrective actions

3-7A Hexavalent chromium using USEPA methods 3060A/7196A quality control requirements and corrective actions

3-7B Hexavalent chromium using USEPA methods 3060A/7199 quality control requirements and corrective actions

3-8 Ammonia using USEPA method 350.1, nitrate using USEPA method 353.2, nitrite using USEPA method 353.2 and sulfate using USEPA method 300.0 quality control requirements and corrective actions

DISTRIBUTION LIST

BMS Project Manager - TBD

Consultant Project Manager – TBD

Laboratory Project Manager – TBD

LIST OF ACRONYMS/ABBREVIATIONS

%D	Percent difference
%R	Percent recovery
%RSD	Percent relative standard deviation
ACS	American Chemical Society
APHA	American Public Health Association
AWWA	American Water Works Association
BFB	Bromofluorobenzene
BMS	Bristol-Myers Squibb Company
CCB	Continuing Calibration Blank
CCV	Continuous Calibration Verification
CLP	Contract laboratory program
COC	Chain-of-custody
COD	Coefficient of Determination
CV	Coefficient of variation
DBMS	Database management system
DCHA	Dicyclohexylamine
DFTPP	Decafluorotriphenylphosphine
DMA	N, N-dimethylaniline
DQO	Data quality objective
DSR	Duplicate sample result
DUSR	Data Usability Summary Report
EB	Equipment blank
EDD	Electronic disk deliverable
ELAP	Environmental Laboratory Approval Program
FTDS	Field Test Data Sheet
GC/MS	Gas chromatography/mass spectrometry
GW	Groundwater
HASP	Health and Safety Plan
ICB	Initial Calibration Blank
ICP	Inductively coupled plasma
ICSA	Interference check sample A
ICSAB	Interference check sample AB
ICV	Initial Calibration Verification
ID	Identification
IDL	Instrument detection limit
LCS	Laboratory control sample
MDL	Method detection limit
MEK	Methyl ethyl ketone
MIBK	Methyl isobutyl ketone
MS/MSD	Matrix spike/matrix spike duplicate
MSB	Matrix spike blank

NIST	National Institute of Standards and Technology
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSR	Original sample result
PCB	Polychlorinated biphenyl
PID	Photoionization Detector
PPE	Personal protective equipment
QA/QC	Quality assurance/quality control
QAM	Quality assurance manual
QAO	Quality Assurance Officer
QAPP	Quality assurance project plan
QL	Quantitation limit
RPD	Relative percent difference
RF	Response factor
RT	Retention time
RSD	Relative standard deviation
SCO	Soil Cleanup Objectives
SCG	Standards, criteria, and guidance
SDG	Sample delivery group
SOP	Standard operating procedure
SVOC	Semivolatile organic compound
TB	Trip blank
TIC	Tentatively identified compounds
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compound
WEF	Water Environment Federation

1. INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been developed by O'Brien & Gere for field sampling, laboratory analysis, and reporting of subsurface soil, groundwater, and soil vapor to support the Remedial Investigation (RI) at the Bristol-Myers Squibb Company (BMS) Syracuse North Campus Restoration Area (Site No. C734138) (Brownfield Area) located at 6000 Thompson Road in East Syracuse, New York. This QAPP is a component of the RI Work Plan (RIWP) developed by O'Brien & Gere for the Brownfield Area.

This QAPP has been prepared using the following documents as guidance:

- United States Environmental Protection Agency (USEPA). 2006a. EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, EPA QA/R-5. Washington, D.C.
- New York State Department of Environmental Conservation (NYSDEC). 2010. DER-10 Technical Guidance for Site Investigation and Remediation. Albany, NY.

The QAPP will assist in generating data from environmental samples of a known and acceptable level of precision and accuracy. It provides information regarding the project description and personnel responsibilities and sets forth specific procedures to be used during sampling of environmental media, field activities and laboratory analyses. Personnel participating in the field investigation and laboratory analyses will follow the procedures in this QAPP.

The following QA topics are addressed in this document:

- Project background and description
- Data quality objectives and criteria
- Project organization and responsibilities
- Special training requirements
- Documentation
- Sampling design and method requirements
- Sample handling and custody
- Analytical method requirements
- Laboratory quality assurance/quality control (QA/QC) procedures
- Field QA/QC procedures
- Instrumentation/equipment testing and maintenance
- Calibration and frequency
- Inspection requirements for supplies
- Data acquisition requirements
- Data management
- Assessment and response actions
- QA reports to management
- Data review and management
- Data validation and usability
- Reconciliation with user requirements

2. PROJECT BACKGROUND AND SCOPE

This section describes the general scope of work and project objectives for the activities to be performed during the Remedial Investigation. The specific project scope and objectives and Brownfield Area history are presented in the Remedial Investigation Work Plan.

2.1 PROJECT BACKGROUND

The Brownfield Area lies within the BMS Syracuse facility, and beginning with construction of Building 1 in 1943 until 2007, the Area was used for manufacture and packaging of antibiotic pharmaceuticals, including penicillin and cephalosporin. The Remedial Investigation is being performed in accordance with the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP). The Brownfield Cleanup Agreement (BCA) between BMS and NYSDEC was executed on October 18, 2011. A detailed description of the history of the site, potential areas of concern, and the approach of the Remedial Investigation is described in the Remedial Investigation Work Plan.

2.2 PROJECT SCOPE

The RI will be conducted in a phased approach. The first phase of the RI will consist of collection of groundwater, surface and subsurface soil in the identified Areas of Concern. After this initial work, soil vapor and sediment sampling and installation of downgradient wells will be completed. The scope of subsequent phases of RI will depend on the results generated during the first phase. The results from the RI will be utilized to develop a Conceptual Brownfield Model, assemble appropriate remedial action objectives (RAOs), and identify the recommended remedial alternative for the Brownfield Area.

The sample containers, preservation, QC samples and holding times applicable to this project are presented in Table 1. The analytical methods, method detection limits (MDLs), quantitation limits (QLs), target analytes and regulatory criteria applicable to this project are presented in Tables 2-1A, 2-1B, 2-2, 2-3 and 2-4.

2.2.1 Laboratory Analysis

All samples of environmental media will be submitted for analysis to a laboratory that is certified by the Environmental Laboratory Approval Program (ELAP) of the New York State Department of Health (NYSDOH).

The sample containers, preservation, QC samples and holding time applicable to this project are presented in Table 1. The MDLs and QLs for target analytes listed in Tables 2-1A, 2-1B, 2-2, 2-3 and 2-4, or the most recent detection limits for those target analytes, will be reported by the laboratory on the sample result sheets. Tables 2-1A, 2-1B, 2-2, 2-3 and 2-4 also present the applicable regulatory criteria which will be used to evaluate the analytical data.

The laboratory will provide the required sample collection and shipment containers for the sampling program.

Communications with the consultant relative to the analysis of environmental media samples will be documented by the laboratory in analytical data packages.

Data results will be reported in hard-copy and electronic versions as specified in Section 16.

2.2.2 Data Validation

Data validation will be performed on the data collected for the Brownfield Area Remedial Investigation utilizing the NYSDEC Data Usability Summary Report (DUSR) guidance (NYSDEC, 2010). Data will be evaluated during validation using the QA/QC criteria established in the methods, the quality control requirements and corrective actions listed in Tables 3-1A, 3-1B, 3-1C, 3-2, 3-3, 3-4, 3-5, 3-6, 3-7A, 3-7B and 3-8 and laboratory established control limits.

Data affected by excursions from the previously described QA/QC criteria will be qualified using USEPA Region II data validation guidance and professional judgment. The application of these validation guidelines will be

modified to reflect method and QAPP requirements, where applicable. Upon request of the data validator, the laboratory will provide additional or supplemental information within three working days of the request during the validation process.

The specific data quality requirements including precision, accuracy, representativeness, completeness, comparability, and sensitivity will be assessed during data validation. Data usability with respect to the data quality objectives and data uses will be compared to the project requirements. In the event that the completeness objective of 95% is not achieved, at the discretion of the Project Manager (defined in Section 4.3.2), new samples may be collected.

2.2.3 Audits

At the discretion of the Project Manager (defined in Section 4.3.2), a field audit and laboratory audit may be performed during the Brownfield Area Remedial Investigation. Additional audits may be required if issues that would severely limit the use of the sample data are identified during the investigation. Corrective action procedures will be implemented in the event of unacceptable audit results, as defined herein.

2.2.4 Documentation

The analytical laboratory will provide an EQuIS 4-file EDD populated with the latest NYSDEC valid values. Valid values are provided at the following link: http://www.earthsoft.com/products/edp-format-for-nysdec . The EDD must comply with the NYSDEC's Environmental Data Submission electronic data deliverable (EDD) format, all data generated will be submitted to the NYSDEC in an EDD format. Data will be managed in a relational data base management system (DBMS). Laboratory analytical data will be provided in EDD format for direct upload into the DBMS. Data validation qualifiers will be entered into the DBMS and checked independently.

Records will be incorporated into the final project files for the samples. The field logs, data packages, and records will be included in the project files, which will be archived by the Project Manager (defined in Section 4.3.2) for a period no less than ten years.

3. DATA QUALITY OBJECTIVES AND CRITERIA

The Data Quality Objective (DQO) Process, as it has been applied to the Brownfield Area Remedial Investigation activities, comprises the following steps, consistent with guidance presented in the USEPA *Guidance for the Data Quality Objectives Process* (EPA QA/G-4), February 2006. The DQO Process establishes the acceptance criteria, which serve as the basis for collecting data of sufficient quality and quantity to support the goals of the Brownfield Area Remedial Investigation activities.

3.1 DQO PROCESS

The process consists of the following seven iterative steps for the DQO process:

- **Step 1** - *State the problem* - The Brownfield Area Remedial Investigation activities need to identify, evaluate, and confirm contamination of environmental media associated with and emanating from the Brownfield Area.
- **Step 2** - *Identify the goal of the study* - The Brownfield Area Remedial Investigation activities will be utilized to identify, evaluate and confirm the presence of Brownfield Area-related contaminants in environmental media at and emanating from the Brownfield Area. The nature and extent of contamination at or emanating from the Brownfield Area will provide a basis for evaluating potential exposures and selecting and developing remedial alternatives, consistent with the intended future use of the Brownfield Area.
- **Step 3** - *Identify information inputs (the data types that will be required before project decisions can be made)* - Site history that addresses the source of any contaminants previously identified will be presented in the RI Work Plan. The primary data types that will be required are analytical results from sampling of environmental media at and in the vicinity of the Brownfield Area.
- **Step 4** -*Define the boundaries of the study (the spatial and temporal features pertinent for decision making)* - The Investigation will be performed in and around the Brownfield Area which is located in the Town of DeWitt and Village of East Syracuse in Onondaga County, New York. The Brownfield Area generally encompasses approximately 24 acres and includes the area formerly associated with the production of penicillin and other related products from the 1940's through approximately 2007.
- **Step 5** - *Develop the analytic approach (how will the study results be analyzed and conclusions derived from the data)* - Results of contaminants identified in the environmental media at concentrations above applicable SCGs will provide a basis for identifying potential exposures and selecting and developing remedial alternatives for the Brownfield Area.
- **Step 6** - *Specify performance or acceptance criteria (performance or acceptance criteria that the collected data will need to achieve)* - Data must be of known quality to withstand scientific and legal challenges relative to its intended purpose. Completeness is the measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under normal conditions. Based on evaluation of the data in terms of precision, accuracy, representativeness, comparability, and sensitivity, a completeness objective of 95% of the data set has been established for these Brownfield Area Remedial Investigation. Additional sampling may be warranted if the completeness objective is not met.
- **Step 7** - *Develop the plan for obtaining data* - The environmental media samples will be collected and analyzed as described in this QAPP.

To meet the DQOs for these Brownfield Area Remedial Investigation, environmental data will be compared to the following NYS SCGs where applicable:

- Title 6 of the Official Compilation of New York Codes, Rules, and Regulations (6NYCRR Part 375) – Remedial Program Soil Cleanup Objectives;
- 6NYCRR Part 703 – Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations – New York State Class GA Groundwater Standards;

- *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations,* Division of Water Technical and Operational Guidance Series 1.1.1;
- CP-51 – Soil Cleanup Guidance;
- Guidance for Evaluating Soil Vapor Intrusion in the State of New York; and
- Technical Guidance for Screening Contaminated Sediments.

3.2 ANALYTICAL LEVELS

Analytical levels as defined by USEPA as follows:

- Screening Data – Screening data are generated by rapid, less precise methods of analysis with less rigorous sample preparation. Sample preparation steps may be restricted to simple procedures such as dilution with a solvent, instead of elaborate extraction/digestion and cleanup. Screening data provide analyte identification and quantitation, although the quantitation may be relatively imprecise. At least 10% of the screening data will be confirmed using analytical methods and QA/QC procedures and criteria associated with definitive data. Screening data without associated confirmation data are not considered to be data of known quality. During the Brownfield Area Remedial Investigation activities, dissolved oxygen, temperature, oxidation-reduction potential, pH, turbidity, and specific conductance may be measured in the field. Solid samples collected from geoprobe/soil borings, and sediments may be screened for volatile organic compounds (VOCs) by a photoionization detector (PID).

- Definitive Data – Definitive data are generated using rigorous analytical methods, such as USEPA reference methods. Data are analyte-specific, with confirmation of analyte identity and concentration. Methods produce tangible raw data in the form of paper printouts or computer-generated electronic files. Data may be generated at the Brownfield Area or at an off-Brownfield Area location, as long as the QA/QC requirements are satisfied. For the data to be definitive, either analytical or total measurement error must be identified. The level of QC that will be performed for the definitive data involves the QC efforts described in Section 10, calibration procedures described in Section 13, analytical methods listed in Table 1, and QC requirements and corrective actions listed in Tables 3-1 through 3-8. Laboratory control limits for accuracy and precision, will be used to evaluate the sample data.

The QA/QC program described in this QAPP was developed in order to assess adherence to DQOs described previously. The remainder of this QAPP describes the specific approaches that will be taken to achieve the required DQOs.

Precision describes the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements that have been made in an identical manner, compared to their average value. Precision can be expressed in a variety of manners that include absolute methods such as deviation from the mean or median values, standard deviation and variance, or relative methods (*e.g.*, relative deviation from the mean or median). The overall precision will be determined through the analysis of field duplicates, laboratory duplicates, and matrix spike/matrix spike duplicate (MS/MSD) samples.

Accuracy is defined as the degree of difference between measured or calculated values and the true value. The closer the numerical value of the measurement comes to the true value, or actual concentration, the more accurate the measurement is. Accuracy is expressed in terms of absolute or relative error. Accuracy will be determined through analysis of spiked samples and the analysis of standards with known concentrations.

Representativeness refers to the degree to which a sample taken from the Brownfield Area accurately reflects the matrix at the Brownfield Area. It is a qualitative parameter that is most concerned with the design of the sampling program. Factors that should be considered in the determination of representativeness include appropriateness of sampling and analytical methodologies, representativeness of the selected media, and representativeness of the selected analytical procedures. Representativeness will be achieved by the use of procedures for the collection and preservation of samples as described in the Work Plan and the methods in this QAPP.

Comparability refers to the use of consistent procedures, second source reference standards, reporting units, and standardized data format with document control. Adherence to standard procedures and the analysis of external source standard materials maximizes the probability that data generated from a particular method at a given laboratory can be validly compared to the data of another. This QAPP has been written to provide data that will be comparable to other data collected, as standard methods will be utilized for these Brownfield Area Remedial Investigation activities.

Completeness refers to the process of obtaining the required data as outlined in the investigation-specific Work Plan. Completeness is also defined as the percentage of measurements judged to be useable. Samples for which the critical data points fail completeness objectives will require reanalysis of samples (within the specified holding times) until the DQOs are met. The completeness goal has been specified at 95% for these Investigation activities.

Sensitivity refers to a measurable concentration of an analyte that has an acceptable level of confidence. MDLs are the lowest concentration of an analyte that can be measured with 99% confidence that the analyte concentration is greater than zero. QLs are levels above the MDLs at which the laboratory has demonstrated the quantitation of analytes.

3.3 FIELD SAMPLING OBJECTIVES

The objective of the field sampling program is to obtain samples that represent the environmental matrix being investigated. This will be accomplished through the use of proper sampling techniques and equipment as presented in the Work Plan.

Field screening activities may not require sample collection but, nonetheless, involve measurements for which QA concerns are appropriate. The primary QA objective of field screening is to obtain reproducible measurements to a degree of accuracy consistent with the intended use of the measurements and to document measurement procedures.

3.4 LABORATORY OBJECTIVES

To obtain data of a quality sufficient to meet the project DQOs, the laboratory will adhere to the specific analyses and QA/QC requirements in the analytical methods listed in Table 1. The methods cited in this QAPP provide data of sufficient quality for comparisons to the regulatory criteria. The laboratory Standard Operating Procedures (SOPs) and Quality Assurance Manual (QAM) will be made available to the data validators upon request.

4. PROJECT ORGANIZATION AND RESPONSIBILITY

The consultant will be responsible for project management and sample collection. Any laboratory performing the analyses will be certified by the NYSDOH Environmental Laboratory Approval Program (ELAP). Responsibilities for key project team members are summarized below. Individual resumes will be available upon request.

4.1 REGULATORY AGENCY

The NYSDEC Project Manager will have oversight authority for each Brownfield Area Remedial Investigation.

4.2 BMS PROJECT MANAGER

The BMS Project Manager will be responsible for the execution of each phase of the project, including corresponding and coordinating activities with NYSDEC.

4.3 CONSULTANT KEY PERSONNEL

4.3.1 Project Officer

The Project Officer will have overall responsibility for meeting the stated project objectives. In addition, the Project Officer will be responsible for providing the Project Manager with access to corporate resources.

4.3.2 Project Manager

The Project Manager will be responsible for implementing the project and has the authority to commit the resources necessary to meet project objectives and requirements. The Project Manager's primary function is to meet the technical, financial, and scheduling objectives and milestones and to provide direction to the Project Team.

4.3.3 Quality Assurance Officer

The Quality Assurance Officer (QAO) will manage and be responsible for QA/QC review of data generated during the Brownfield Area activities. Data validation will be overseen by the QAO. If QA problems or deficiencies requiring special action are identified, the QAO and Project Manager will determine the appropriate corrective action. The QAO will be responsible for follow-up and oversight of corrective action implementation to the satisfaction of BMS and the NYSDEC representative.

4.3.4 Data Validator

Data Validators will be responsible for review of laboratory data for compliance with the project-specific DQOs and for such parameters as precision, accuracy, representativeness, comparability, and completeness. Data Validators will notify the QAO of any major QA deficiencies. Data validation will be overseen by the QAO.

4.3.5 Field Team Leader

The Team Leaders and will support the Project Manager. The Field Team Leaders will be responsible for directing and coordinating the day-to-day activities of the various resource specialists and will report directly to the Project Manager on a daily basis while field activities are underway. The Field Team Leaders will be present during sampling activities and will keep a general log describing activities conducted during the Brownfield Area Remedial Investigation, which will include the identification of personnel entering the Brownfield Area and the recording of general observations regarding Brownfield Area activities.

4.3.6 Field Sampling Personnel

Field Sampling Personnel will be responsible for collection, packaging, preservation, and shipping of environmental samples in accordance with the Work Plan, QAPP and applicable NYSDEC requirements.

4.4 LABORATORY MANAGEMENT

The laboratory that will perform analyses for these Investigation activities will be determined in the future. The analytical laboratory certification number will be provided by the laboratory.

4.4.1 Laboratory Project Manager

The Laboratory Project Manager will be responsible for the following tasks:

- Coordinating laboratory analysis;
- Supervising in-house chain-of-custody (COC);
- Scheduling sample analysis;
- Overseeing data review; and
- Overseeing preparation of analytical reports.

It will also be the responsibility of the Laboratory Project Manager to approve final analytical reports prior to submission to the Consultant.

4.4.2 Laboratory Quality Assurance Manager

The Laboratory QA Manager will be responsible for overview of the laboratory QA, overview of the QA/QC documentation, and conducting detailed data review. The Laboratory QA Manager will decide if laboratory corrective actions are required in addition to seeing that laboratory SOPs are followed.

4.4.3 Laboratory Sample Management Supervisors

The Laboratory Sample Management Supervisors will be responsible for the following tasks:

- Receive and inspect incoming sample containers;
- Record condition of incoming sample containers;
- Sign appropriate documents;
- Verify chain-of-custody and its correctness;
- Notify Laboratory Project Manager of sample receipt and inspection;
- Assign unique identification number and customer number, and enter these numbers into sample receiving log;
- Initiate transfer of samples to appropriate lab sections; and
- Control and monitor access/storage of samples and extracts.

Primary responsibility for project quality rests with the Laboratory Project Manager. Independent QA will be provided by the Laboratory QA Manager prior to release of data to the Consultant.

5. SPECIAL TRAINING REQUIREMENTS

As described in the Health and Safety Plan developed for the Brownfield Area Remedial Investigation, field personnel must comply with the training requirements for hazardous waste operations in accordance with 29 CFR 1910.120(e). Each individual must have successfully completed a 40-hour course for intrusive work and, minimally, a 24-hour course for non-intrusive work. In addition, each individual must have completed an 8-hour refresher course within the last 12 months if the initial training was more than 12 months ago. Personnel acting in the capacity of a Brownfield Area supervisor (*e.g.*, directly responsible for supervising employees engaged in hazardous waste operations) will also have successfully completed an 8-hour supervisor training course.

6. DOCUMENTATION

At the discretion of the Project Manager, this QAPP will be amended by the QAO, as necessary, when guidelines and regulatory documents are revised or if site requirements necessitate such changes. Any modification to the QAPP must be approved by NYSDEC. Whenever the QAPP is amended, the project personnel will receive the amended copy of the QAPP and outdated copies will be removed from circulation.

Field sampling operations and procedures will be documented by on-site personnel in bound field logbooks. Documentation of sampling operations and procedures will include the following:

- Procedures for preparation of reagents or supplies that become an integral part of the sample;
- Procedures for recording location and specific considerations associated with sample collection;
- Specific sample preservation method;
- Calibration of field instruments;
- Submission of field-based blanks, where appropriate;
- Potential interferences present at the Brownfield Area;
- Field sampling equipment and containers including specific identification numbers of equipment;
- Sampling order;
- Decontamination procedures; and
- Identity of field personnel.

The analytical data results will be reported by the laboratory to the Project Manager using NYSDEC Category B deliverables format and EDDs that comply with the NYSDEC's requirements. The data packages will also be provide in electronic format.

A comprehensive case narrative that describes the following information will be included in the data package:

- Cross reference list that includes field sample identification name, laboratory identification number, and sample dates for each sample in the sample delivery group (SDG) included in the data package;
- Documentation of methodologies utilized to prepare and analyze samples and references;
- Detailed documentation of QC, sample shipment, and analytical problems encountered in processing samples for the data package;
- Documentation of re-analyses, internal QC processes used, corrective actions taken, and resolution of corrective actions taken; and
- Documentation of communications made with the Project Manager and QAO during the data generation process.

The laboratory will provide two hard copies and one electronic copy of the data packages within 4 weeks of receipt of the last sample in a sampling event at the laboratory. Field logs, data packages, and records will be included in the project file which will be archived for a period of ten years.

7. SAMPLING DESIGN AND METHOD REQUIREMENTS

7.1 SAMPLING NETWORK

The types of methods, sample matrices, and numbers of samples to be collected for the Investigation are presented in the Work Plan and **Table 1**. The specific parameters for each method and the associated laboratory QLs and MDLs are listed in **Tables 2-1 through 2-4**.

7.2 SAMPLE LOCATIONS AND DESIGNATIONS

A sample designation system will be used to identify samples for laboratory analysis. A list of the unique identifiers used for each sample will be maintained in the project logbook by the Field Team Leaders. Sample locations and a Brownfield Area map are presented in the Work Plan.

Each sample that is collected will be designated by a unique sample identification number as outlined in the FSAP. Field duplicates will also be identified with a unique sample identification number, such that the laboratory will not be aware of the sample location utilized as the blind duplicate. The field sampling personnel will note the duplicate sample in the logbook so that this information will be available when the laboratory data is reviewed.

7.3. SAMPLING PROCEDURES

Specific sampling procedures are presented in the Work Plan. Procedures for soil vapor sampling and QC sample collection are discussed below.

7.3.1 Soil Vapor Sampling Procedure

Canister vacuum will be measured with a National Institute of Standards and Technology (NIST)-traceable digital vacuum gauge (calibrated within the previous 12 months). Procedures for measurement of helium using field equipment are included in manufacturer's instructions, which will be reviewed by the field staff prior to the commencement of field activities.

Soil vapor samples will be collected into evacuated, individually or batch certified-clean, 1-L or 6-L pre-evacuated canisters supplied by the certified laboratory. Vacuum readings of the canisters will be obtained and documented prior to sample collection and upon completion of sampling. Sample identification, vacuum readings, flow controller identification numbers, and other relevant information will be recorded on appropriate soil vapor collection field forms. Canisters must be returned to the laboratory within 15 days of evacuation and shipment to the Brownfield Area for sampling due to the loss of pressure during storage.

7.3.2 Field Duplicate Sampling Procedure

Field duplicate samples will be collected from the same location as the parent sample and will be analyzed for the same parameters as the parent sample. The actual identification of the duplicate QC samples will be recorded in the field logbook. One field duplicate QC sample will be collected for every 20 samples collected or one per matrix for less than 20 samples for each analysis type.

7.3.3 Matrix Spike/Matrix Spike Duplicate Sampling Procedure

The MS/MSD samples will be collected from the same location as the parent sample and will be analyzed for the same parameters as the parent sample. Each sample will be labeled with the same number as the original sample, designated as MS or MSD, and submitted to the laboratory for the appropriate analyses. One MS and MSD sample will be collected for every 20 samples or one per matrix for less than 20 samples for each analysis type.

7.3.4 Field/Equipment Blank Sampling Procedure

A field/equipment blank will be prepared for sampling when a particular piece of sampling equipment is employed for sample collection and subsequently decontaminated in the field for use for additional sampling. The blank water used to generate the field blank will be provided by the laboratory using the same source of water as that used to prepare method blanks. The field/equipment blank will be composed in the field by collecting, in the appropriate container for the water, a blank water rinse from the equipment after execution of the last step of the proper field decontamination protocol. The identical bottle to bottle transfer technique will be used to generate the field blank. Preservatives or additives will be added to the field blank, where appropriate, for the sampling parameters. One field blank will be collected for every 20 samples or one per matrix for less than 20 samples for each analysis type. The field/equipment blank will be analyzed for the same parameters as the samples collected the same day that the field blank was generated.

7.3.5 Trip Blank Procedure

A trip blank will be included in the cooler used to ship aqueous and solid samples for VOC analysis. The trip blank is designed to address possible sample contamination from transportation between the Brownfield Area and the laboratory. A trip blank will be prepared by the laboratory using the same preservation technique as that used to prepare the sample containers from the same source as the method blank water and sent to the Brownfield Area in the cooler with the other sample containers. Non-aqueous samples collected utilizing methanol preservation will require trip blanks prepared using the same technique as that used to prepare the samples containers. Trip blanks are not opened in the field but travel with the sample containers. One trip blank will be sent to the laboratory for analysis in each cooler that contains samples that have been collected for VOCs.

7.4 DECONTAMINATION OF SAMPLING EQUIPMENT

Sampling methods have been developed to minimize the possibility of cross-contamination. The FSAP describes specific decontamination procedures that will be followed based on the type of equipment that is used.

8. SAMPLE HANDLING AND CUSTODY

8.1 SAMPLE CUSTODY AND PROCEDURES

Chain-of-custody (COC) procedures will be instituted and followed throughout the investigation. These procedures include field custody, laboratory custody, and evidence files. Samples are physical evidence and will be handled according to strict COC protocols. The QAO must be prepared to produce documentation that traces the samples from the field to the laboratory and through analysis. The USEPA has defined custody of evidence as follows:

- In actual possession;
- In view after being in physical possession;
- In a locked laboratory; and
- In a secure, restricted area.

8.2 SAMPLE PREPARATION

Quality Assurance measures for this project will begin with the sample containers; pre-cleaned containers will be purchased from a USEPA-certified manufacturer (I-Chem 200 or equivalent). For soil vapor sample collection, certified-clean sample SUMMA™ canisters will be provided by the laboratory. The laboratory that certifies the SUMMA™ canisters as clean must also conduct the analysis of the samples. The laboratory will begin a field test data sheet (FTDS), which will follow the canister to the field and back to the laboratory. The FTDS does not replace the need for a chain of custody to be completed in the field and follow the sample canisters from the field to the laboratory.

Table 1 lists the proper sample container, sample volumes, preservation, and holding times. Table 3-1B describes the canister preparation requirements. The maximum time canisters can be held on-site prior to sample collection is 15 days after shipment of the canister by the laboratory.

Immediately after collection, aqueous and solid samples will be transferred to properly labeled sample containers and properly preserved. Sample canisters will be labeled. Samples requiring refrigeration for preservation will be promptly transferred to coolers packed with wet ice and/or ice packs. If field storage is required, the samples will be stored in a secured storage facility and a cooler temperature of 4°C will be maintained.

8.3 FIELD CUSTODY PROCEDURES

The field sampler is personally responsible for the care and custody of the sample until transferred. The field logbook will be used to note information regarding collection of samples and any observations. All entries will be signed and dated. Field logbooks will be waterproof and bound. The logbook will be dedicated to the project and pages will not be removed. Corrections will be made by drawing a single line through the incorrect data and initialing and dating the correction that was made to the side of the error. An initialed diagonal line will be used to indicate the end of an entry or the end of the day's activities.

The following information will be recorded in the field logbook by the field sampling team:

- Location of field activity;
- Date and time of entry;
- Names, titles of any site visitors, as well as the date and time entering and leaving the site;
- Weather information, for example: temperature, cloud coverage, wind speed, and direction;
- Purpose of field activity;
- A detailed description of the fieldwork conducted;
- Sample media (e.g. soil, groundwater, etc.);
- Description of sampling point(s);

- Analytical parameters;
- Date and time of collection;
- Sample identification number(s);
- Field observations;
- Field measurements made (e.g.; volatile organic compounds (VOCs) using a photoionization detector (PID), pH, temperature, conductivity, water level);
- References for maps and photographs of the sampling site(s); and
- Information pertaining to sample documentation such as:
  - Bottle lot numbers;
  - Dates and method of sample shipments;
  - Chain-of-custody record numbers; and
  - Federal Express air bill number.

A completed sample identification label or tag will be sequentially numbered, attached to each investigative or QC sample, and placed with the sample in a shipping container. The identification on the label/tag must be sufficient to enable cross-reference with the logbook. The sample label/tag will be recorded using waterproof, non-erasable ink and will be attached to the sample container using adhesive.

The sample labels/tags will contain the following information:

- Sample number identification;
- Project number;
- Date and time of sample collection;
- Designation of the sample as a grab or composite;
- Type of sample matrix;
- Sample location;
- Signature of the sampler;
- Whether the sample is preserved or unpreserved;
- Space for laboratory sample number (only on the sample tag); and
- General types of analysis to be performed.

8.4 CHAIN OF CUSTODY PROCEDURES

COC records will be kept starting in the field when sample collection is completed and kept with the sample containers placed in the coolers for transportation to the laboratory. One completed COC record must be kept with each sample cooler at all times.

For soil vapor samples, the external COC commences with the preparation of the canisters at the laboratory for shipment to the investigator. The laboratory will initiate the COC record and transfer the canister under strict COC to the field representative.

The following measures will be taken when completing a COC record:

- Chain-of-custody and sample collection forms will be completed in waterproof, non-erasable ink;
- Chain-of-custody forms will be completed neatly using printed text. If a simple mistake is made, the error will be lined out with a single line, initialed, and dated;
- Each separate sample entry will be sequentially numbered;
- The use of "Ditto" or quotation marks to indicate repetitive information in columnar entries should be avoided. If numerous repetitive entries must be made in the same column, a continuous vertical arrow will be used between the first entry and the next different entry;

- When more than one COC form is used for a single shipment, each form will be consecutively numbered using the "Page ___ of ___" format;
- If necessary, additional instructions will be placed directly onto the COC form; and
- Acronyms used on a COC form will be defined.

The COC form will contain the following information:

- Project identification and number;
- Sample description/location;
- Required analysis;
- Date and time of sample collection;
- Type and matrix of sample;
- Number of sample containers;
- Analysis requested/comments;
- Sampler signature/date/time;
- Date and signature of the field representative;
- Date and signature of the laboratory representative;
- Carrier used to ship coolers; and
- Air bill number (if shipped by a commercial carrier).

In the case that high concentrations are suspected to be present in the samples, a note to that effect will be included on the COC form.

For soil vapor samples, the Field Test Data Sheet (FTDS) must be completed for each sample canister in addition to the standard COC. The FTDS is initiated by the laboratory and accompanies the canisters to and from the Brownfield Area. The form will include the following:

- Brownfield Area information;
- Canister size, serial number, and flow controller number;
- Sampling dates and shipping date;
- Sampling information: ambient temperature and barometric pressure, canister pressure, sampling times, and interior temperature (where applicable);
- Laboratory information: flow rates (shipping out from laboratory and received from Brownfield Area), canister pressure (initial and final); and
- Date container shipped out and received back, canister certification number, individual certification number and signature of gas chromatography/mass spectrometry (GC/MS) analyst.

The FTDS will be completed and copied, and the original and one copy of each will be placed in a sealed Ziploc® bag in the shipping container and the second copy retained for the project file.

Environmental samples will be packed prior to shipment using the following procedures:

- Select a sturdy cooler or box for soil vapor canisters in good repair and clean. Secure and tape the cooler drain plug with fiber or duct tape;
- Be sure the lids on all bottles are tight (*i.e.*, will not leak, *etc.*), and baggies are sealed;
- For aqueous and solid samples, place ice that has been placed in heavy-duty polyethylene bags and properly sealed on top of or between the samples. Pack samples securely to eliminate breakage during shipment with ice packs to maintain the inside temperature at approximately 4°C;
- Sampling containers will be packed with packing materials. When possible, sample container preparation and packing for shipment will be completed in a well-organized and clean area. Sample containers will be prepared for shipment by wiping containers clean of debris/water using paper towels. Paper towels will be disposed with the personal protective equipment (PPE);

- Place the COC record into a Ziploc® plastic bag, tape the bag to the inner side of the cooler lid, and close the cooler and securely tape (preferably with fiber tape) the top of the cooler shut. Two custody seals will be affixed to the latch and lid of the box or cooler. The number of the security seal will be recorded on the COC form. The custody seals will consist of adhesive-backed tape that easily rips if it is disturbed. The field sampler will initial and date the seal. The seals must be broken to open the cooler and will indicate tampering if the seal is broken before receipt at the laboratory; and
- A label containing the name and address of the shipper will be placed on the outside of the container.

The field sampling team will transport or ship the cooler via an overnight delivery service or hand deliver to the laboratory. Prior to shipment of sample coolers, the field sampling team will contact the laboratory to notify the laboratory of the shipment.

Samples will remain in the custody of the sampler until transfer of custody is completed. Transfer will include:

- For Samples being shipped:
  - Signature of sampler to acknowledge relinquishing the samples prior to sealing of the sample cooler; and
  - Signature of the Laboratory Sample Custodian on the COC form to acknowledge receiving the samples;
- For samples being hand-delivered:
  - Delivery of samples to the Laboratory Sample Custodian;
  - Signature of the of the sampler relinquishing the samples; and
  - Signature of the Laboratory Sample Custodian on the COC form to acknowledge receiving the samples.

The field sampling team will ship the coolers or boxes containing canister samples containing environmental samples to the laboratories identified for this project by commercial carrier. Samples will not be shipped to another laboratory without the permission of the Project Manager.

The COC document will be completed by the field sampler and provided for each sample cooler. When transferring the possession of samples, individuals relinquishing and receiving will sign, date, and note the time on the COC. Custody of samples must be continuous between parties, and time gaps must not be present. Each shipment of samples to the laboratory must have its own COC record with the contents of the shipment, method of shipment, name of courier, and other pertinent information written on the record. The original record accompanies the shipment, and the copies are kept with the field logbook and distributed to the Project Manager. A copy of the COC will be faxed or emailed to the laboratory and Project Manager on the same day of sample shipment. Freight bills, postal service receipts, and bills of lading will be retained as permanent documentation.

If a carrier is used to take samples between the sampler and the laboratory, the air bill tracking number must be written on the chain-of-custody. Samples will be shipped or transported within 24 hours of being collected and will arrive at the laboratory no later than 48 hours after sample collection.

8.5 LABORATORY CHAIN OF CUSTODY PROCEDURES

Laboratory custody procedures continue when the samples are received by the laboratory. When the samples arrive at the laboratory, the Laboratory Sample Custodian will sign the courier's air bill or bill of lading (unless hand-delivered) and will note the cooler temperature on the COC form. If the cooler temperature is greater than 4°C, where applicable, the Project Manager will be notified. If the samples were shipped, the courier's air bill number will be attached to the COC, and the air bill number will be written on the COC form. If the cooler arrives at the laboratory after hours, an external COC will be properly filled out and will accompany the cooler until the laboratory receives the cooler.

The Laboratory Sample Custodian's duties and responsibilities upon sample receipt will be to:

- Document receipt of samples by signing the record with the date and time of sample receipt;
- Note the cooler temperature on the COC form (where appropriate);

- Inspect sample shipping containers for the presence or absence of custody seals (only if shipped via overnight courier) and for container integrity;
- Sign the appropriate forms or documents, verify, and record the agreement or disagreement of information on sample documents and, if there are discrepancies, record the problem and notify the Project Manager;
- Assign a number for each sample upon receipt. That sample number will be placed on the sample label which will remain attached to the sample container;
- Log sample information into the laboratory sample tracking system;
- Label sample with a unique, sequential laboratory sample number; and
- Place samples in the walk-in cooler or sample storage area that is a secure, limited-access storage.

If QC samples have not been properly identified during sample collection, the Laboratory Project Manager will contact the Project Manager to assign QC samples prior to the start of sample analysis.

The laboratory will immediately contact the Project Manager if issues pertaining to sample condition or documentation are detected (*e.g.*, broken security seal; broken, open, or otherwise compromised sample containers; or COC information in disagreement with sample labels).

At the laboratory, the analysts will be required to log samples and extracts in and out of storage as the analysis proceeds. There must not be a lapse in the custody for the sample containers and exchanges of custody must be documented on the form. Samples will be returned to secure storage at the close of business. Care must be exercised to properly complete, date, and sign records needed to generate the data package.

Procedures to be followed by the laboratory include:

- Samples will be handled by the minimum number of people possible;
- The laboratory will set aside a secured sample storage area consisting of a clean, dry, refrigerated, isolated room;
- A specific person will be designated sample custodian. Incoming samples will be received by the custodian, who will indicate receipt by signing the COC form;
- The custodian will ensure samples that are heat-sensitive, light-sensitive, radioactive, or require special handling in other ways are properly stored and maintained prior to analysis;
- The analytical area will be restricted to authorized personnel only; and
- After sample analyses are complete, the analytical data will be kept secured and released to authorized personnel only.

8.6 FINAL EVIDENCE FILES

The final evidence file will be the central repository for documents that constitute evidence relevant to sampling and analysis activities as described in this QAPP. The Consultant is the custodian of the evidence file and maintains the contents of evidence files for the Brownfield Area, including relevant records, reported, logs, field notebooks, pictures, subcontractor reports, and data reviews.

Copies of the laboratory data packages will be stored by the laboratory for incorporation into the sample file. The Laboratory Project Manager will be responsible for laboratory data packages.

Upon completion of the analyses, the Project Manager will assimilate the field and laboratory data. In this way, the file for the samples will be generated. The final file for the sample will be stored and will consist of the following:

- Laboratory data packages, including summary and raw data from the analysis of environmental and QC samples, chromatograms, mass spectra, calibration data, work sheets, and sample preparation log;
- Chain-of-custody and sample collection records;
- Data validation reports;

- Field notebooks and data;
- Field collection report;
- Pictures and drawings;
- Progress and QA reports;
- Contractor and subcontractor reports; and
- Correspondence.

The evidence file must be maintained in a secured, limited access area until submittals for the project have been reviewed and approved and for a minimum of ten years past the submittal date of the final report.

9. ANALYTICAL METHOD REQUIREMENTS

9.1 ANALYTICAL METHODS

The analytical methods being utilized for the Brownfield Area Remedial Investigation activities are presented in **Table 1**. The laboratories will utilize the analytical methods and additional requirements listed in this QAPP. The most recent laboratory control limits for accuracy and precision will be used to evaluate the sample data. The QC requirements and corrective actions listed in **Tables 3-1 through 3-8**, which augment the method requirements, will be followed by the laboratory. In the event of an analytical system failure, the Laboratory Project Manager will identify the situation and provide corrective action guidance. The QAO will be notified and the situation will be documented in the data package.

QLs may only be achieved in an undiluted sample free of matrix interferences or of high concentrations of target analytes. Established QLs may not be achievable without impacting the instrument quality if matrix interferences are encountered or if high concentrations of target compounds are present. The Laboratory Project Manager and QAO will discuss these situations before the laboratory proceeds with sample analysis. Samples may be diluted only if analytes of concern generate responses in excess of the upper calibration range or linear range of the instrument.

Samples will undergo clean-up procedures applying appropriate USEPA methods for the following situations:

- For solid samples analyzed for semivolatile organic compounds (SVOCs) or polychlorinated biphenyls (PCBs) with QLs that are elevated above the project QLs due to matrix interferences;
- Gas chromatography peaks are not adequately separated to correctly identify target analytes; and
- Where matrix interference prevents accurate quantification and identification of target analytes.

The clean-up, extraction, and sample preparation methods will be listed in the data package.

If the laboratory has taken appropriate actions and matrix interferences prevent the laboratory from achieving the laboratory QLs, the QAO will be contacted as soon as the situation is identified. The Laboratory Project Manager will document in the data package case narrative how the laboratory demonstrated good analytical practices in order to attempt to achieve the specified QLs.

Additional requirements of the laboratory are:

- Blanks will not be subtracted from target analyte results;
- Results for solid samples will be reported on a dry weight basis; and
- If required, tentatively identified compounds (TICs) will be generated for VOC and SVOC analyses as described in Tables 3-1A and 3-2, respectively.

9.2 DETECTION LIMITS

The MDL is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte. The QL is the lowest concentration that can be reliably quantified within specified limits of precision and accuracy during routine laboratory operations.

The lowest initial calibration standard will establish the laboratory QLs for each analysis. The laboratory will report non-detected aqueous and solid sample results to the MDLs. For the remaining aqueous and solid data, results that are less than the QLs but greater that the MDLs will be reported by the laboratory using the "J" flag. The laboratory will report soil vapor sample results to the QLs. The QLs and MDLs for target analytes listed in **Tables 2-1 though 2-4** or the most recent MDLs and QLs will be reported by the laboratory on the sample result forms.

10. LABORATORY QA/QC PROCEDURES

A brief description of laboratory QA/QC analyses is presented in the following sections. **Tables 3-1 through 3-8** summarize the laboratory QC checks, frequency of analysis, control limits, and laboratory corrective actions for the analytical methods.

10.1 GC/MS TUNING

Tuning and performance criteria are established to verify mass resolution, identification, and to some degree, instrument sensitivity. These criteria are not sample-specific; conformance is determined using standard materials. Therefore, these criteria should be met in all circumstances.

10.2 CALIBRATION

Compliance requirements for satisfactory instrument calibration are established to verify that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of analysis, and continuing calibration and performance checks document satisfactory maintenance and adjustment of the instrument on a day-to-day basis.

10.3 BLANKS

Corrective action procedures are implemented for blank analyses if target compounds are detected at concentrations greater than the requirements presented in corrective action **Tables 3-1 through 3-8**. The criteria for evaluation of blanks apply to any blank associated with a group of samples. If problems with a blank exist, data associated with the project must be carefully evaluated to determine whether or not there is an inherent variability in the data for the project, or if the problem is an isolated occurrence not affecting other data.

A method blank is an analyte-free blank that undergoes the preparation procedures applied to a sample. These samples are analyzed to examine whether sample preparation and analysis techniques result in sample contamination. The laboratory will prepare and analyze a method blank with each group of a maximum of 20 samples that are extracted, digested, or analyzed at the same time.

A reagent blank consists of laboratory analyte free water and any reagents added to a sample during analysis only, or straight solvent. This type of sample is analyzed to evaluate whether contamination is occurring during analysis of a sample. A reagent blank is usually analyzed following highly contaminated samples to assess the potential for cross-contamination during analysis.

For soil vapor samples, an instrument blank is an unused, certified canister that has not left the laboratory that undergoes the preparation procedures applied to a sample. These samples are analyzed to monitor target analyte carryover on the instrument when necessary.

10.4 INTERNAL STANDARDS PERFORMANCE

Internal standards, which are compounds not found in environmental samples, will be spiked into samples, blanks, MS/MSDs, matrix spike blanks (MSBs), and laboratory control samples (LCSs) at the time of sample preparation for applicable methods. Internal standards will meet the criteria specified in the corrective action tables.

10.5 SURROGATE EVALUATION

Accuracy and matrix biases for individual samples are monitored for organic analyses using surrogate additions for applicable methods. Surrogates are compounds similar in nature to the target analytes; the surrogates are spiked into environmental samples, blanks, and quality control samples prior to sample preparation for organic analyses.

The evaluation of the results of these surrogate spikes is not necessarily straightforward. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. The review and validation of data based on specific sample results is frequently subjective, since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems.

10.6 LABORATORY CONTROL SAMPLES OR MATRIX SPIKE BLANKS

The LCSs or MSBs are standard solutions that consist of known concentrations of the complete list of target analytes spiked into laboratory analyte-free matrix. They are prepared or purchased from a certified manufacturer from a source independent from the calibration standards to provide an independent verification of the calibration procedure.

These QC samples are prepared and analyzed following the same procedures employed for environmental sample analysis to assess method accuracy independently of sample matrix effects. The laboratory prepares and analyzes a LCS or MSB with each group of 20 samples of similar matrix that are extracted, digested, or analyzed at the same time. Percentage recoveries are evaluated to assess the efficiency of the preparation and analysis method independent of environmental sample matrix effects.

10.7 MS/MSD AND LABORATORY DUPLICATE SAMPLES

The MS/MSD and laboratory duplicate analyses are performed on environmental samples at a frequency of one for every 20 samples of similar matrix for each analysis type. The MS/MSD samples are spiked at the laboratory with the complete list of target analytes. The MS/MSD and laboratory duplicate data are generated to evaluate precision and accuracy of the analytical method with respect to sample matrices.

10.8 ANALYTE IDENTIFICATION AND QUANTITATION

The objective of the qualitative criteria is to minimize the number of erroneous identifications of compounds. An erroneous identification can either be a false positive (reporting a compound present when it is not) or a false negative (not reporting a compound that is present). The identification criteria can be applied much more easily in detecting false positives than false negatives. Negatives or non-detected compounds, on the other hand, represent an absence of data and are much more difficult to assess.

The objective for quantitative requirements is to maximize the accuracy of data and sensitivity of the instrument. Samples are analyzed undiluted to maximize sensitivity unless sample screening indicates the presence of high concentration target analytes. Samples are reanalyzed at the appropriate dilution when concentrations exceed the linear calibration range to maximize accuracy.

Interferences will be identified and documented. Samples are diluted only if analytes of concern generate responses in excess of the linear range of the instrument.

10.9 CORRECTIVE ACTION

Generally, the following corrective actions are taken by the laboratory. When calibration, instrument performance, or blank criteria are not met, the cause of the problem is located and corrected, and the analytical system is recalibrated. Sample analysis does not begin until calibration, instrument performance, and blank criteria are met. The analyses of these samples are investigated, when MS, reference standard, or duplicate analyses are out of control. Depending on the results of the overall QC program for the sample set, the data may be accepted, accepted with qualification, or determined to be unusable.

The QC analysis will be re-prepared and reanalyzed if data are determined to be unusable through the application of the corrective actions listed in this QAPP. If QC criteria are met upon reanalysis, only the new results are reported. If QC criteria are still not met upon reanalysis, both sets of sample results will be reported, and the QAO will be notified of the situation at the time of sample analysis.

If problems arise with procedures or guidelines set forth herein, the QAO and Project Manager, in conjunction with NYSDEC, will formulate an appropriate corrective action.

10.10 CONTROL LIMITS

Control limits are either listed in the appropriate methods or are established separately for respective matrix types for surrogate, LCS, MSB, MS/MSD, and duplicate analyses. Control limits can be considered action limits. The laboratory-established limits are defined as ±3 standard deviations of the mean and correspond to 99.7% confidence limits of a normal distribution curve. Unless previously established, the laboratory will establish control limits for each analyte of concern using a minimum of 20 data points. The control limits are updated by the laboratory on an annual basis. Therefore, the most recent control limits will be used to evaluate data.

10.11 PREVENTATIVE MAINTENANCE

Preventative maintenance procedures are carried out on laboratory equipment in accordance with the laboratory procedures. Maintenance activities are recorded in laboratory documents.

10.12 DATA ASSESSMENT PROCEDURES

The procedures employed by the laboratory to assess the quality of data generated in the laboratory include, but are not limited to, the following:

- Determination of analytical precision per method;
- Determination of analytical accuracy per method;
- Determination of analytical completeness; and
- Determination of MDLs and QLs.

Data quality reviews by analysts, supervisors, managers, laboratory directors, and QA personnel contribute to the total process.

Precision and accuracy may be assessed utilizing control charts. Control charts will consist of line graphs that provide a continuous graphic representation of the state of each analytical procedure. The standard deviation of the mean of the QC measurement is calculated, and the upper and lower warning limits are set at ±2 standard deviation units. The upper and lower control limits are set at ±3 standard deviation units. Acceptable data are realized when results fall between the lower and upper warning limits. If the QC value falls between the control limit and the warning limit, the analysis should be reviewed as possibly out of control.

In general, the accuracy of the methods will be determined by spiking the sample matrix with the analyte and analyzing reference materials with known concentrations. The spiking levels will be selected to reflect the concentration range of interest. Percent recoveries of the spikes and reference materials will be calculated and compared to the established limits.

The precision of the methods will be determined by the analysis of MSD, laboratory duplicate, and field duplicate samples. The precision will be evaluated by calculating the relative percent deviation (RPD) for the duplicates. Relative percent deviation calculations will be compared to the established limits.

The definitions and equations used for the assessment of data quality are discussed below.

- Accuracy – Accuracy is a measure of the nearness of an analytical result, or a set of results, to the true value. It is usually expressed in terms of error, bias, or percent recovery (%R). Normally, the term accuracy is used synonymously with percent recovery. It describes either the recovery of a synthetic standard of known value, or the recovery of a known amount of analyte (spike) added to a sample of known value. The %R or accuracy can be calculated by using:

  %R = (observed value/true value) x 100 *(for standards)*

  %R = (((conc. spike + sample conc.) - sample conc. x 100)]/conc. spike *(for spikes)*

- Precision – Precision refers to the agreement or reproducibility of a set of duplicate results among themselves without the assumption of any prior information as to the true result. It is usually expressed in terms of the percent difference (%D) or RPD. The %D is calculated by using:

%D = (larger SR - smaller SR x 100)/smaller SR

where SR = sample result

The RPD is calculated by using:

RPD = (OSR - DSR x 100)/((OSR + DSR)/2)

where OSR = original sample result and DSR = duplicate sample result.

- Average – The average or arithmetic mean (X) of a set of n values (Xi) is calculated by summing the individual values and dividing by n.

$X = (\sum Xi_{I=1 \text{ to } n})/n$

- Range – The range (R_i) is the difference between the highest and lowest value in a group. For n sets of duplicate values (X_2, X_1), the range (R_i) of the duplicates and the average range (R) of the n sets are calculated by the following equations.

$R_i = X_2 - X_1$

$R = \sum Ri_{i=1 \text{ to } n}/n$

- Standard Deviation and Variance – The standard deviation (S) of a sample of n results is the most widely used measure to describe the variability of a data set. It is calculated by using the following equation.

$$S = \sqrt{\frac{\Sigma (Xi - \overline{X})^2}{n-1}} \; n_{\text{ to } i-1}$$

where X = average of the n results and i = value of result

Normally, X ± S will include 68% and X ± 2S will include approximately 95% of normally distributed data.

The variance is equal to S^2. The percent relative standard deviation (%RSD) or coefficient of variation (CV) is the standard deviation divided by the mean and multiplied by 100 as follows.

CV = 100S/X

The Laboratory Project Manager, with individual laboratory group leaders, will identify any data that should be rated as "unacceptable" based on the assessment of the QA/QC criteria and will notify the QAO.

11. FIELD QA/QC PROCEDURES

A brief description of field QA/QC samples is presented in the following sections.

11.1 FIELD DUPLICATE SAMPLES

Collection of field duplicate samples provides for the evaluation of the laboratory's precision performance by comparing analytical results of two samples from the same location. They are also collected to evaluate field sample collection precision procedures. Samples are collected from one location and sent to the laboratory blind (with two different sample identifications). Duplicates of aqueous samples are obtained by alternately filling samples containers from the same sampling device for each parameter. Duplicates of aqueous samples submitted for VOC analysis from monitoring wells are filled from the same bailer full of water whenever possible and are the first set of containers filled. Duplicates of solid samples submitted for VOC analysis are obtained from discrete locations without mixing. Duplicates for the remaining analyses require homogenization by filling a decontaminated stainless steel tray or bowl with the sample and mixing it with a decontaminated stainless steel instrument. The mixed sample is divided in half and scooped alternatively from each half to fill the sample container. One field duplicate sample will be collected for every 20 samples of similar matrix for each analysis type. If less than 20 samples are collected during a sampling event, one field duplicate sample will be collected for that sample matrix.

11.2 MS/MSD AND DUPLICATE SAMPLES

The MS/MSD samples are duplicate samples that have spiking solutions added at the laboratory during sample preparation and are considered identical to the original sample. The %R of the spiked amount indicates the accuracy of the extraction as well as interferences caused by the matrix. The RPDs between spike sample recoveries will indicate the precision of the data. Duplicates of aqueous samples are obtained by alternately filling samples containers from the same sampling device for each parameter. One MS/MSD sample set will be collected for every 20 of similar matrix for each analysis type. If less than 20 samples are collected during a sampling event, one MS/MSD sample set will be collected for that sample matrix.

Duplicate samples may be prepared for inorganic analyses as an alternative to MSD samples. Duplicate samples are analyzed within the same batch as the environmental samples and to determine precision of the analytical method with respect to sample matrices. For inorganic analyses, duplicate analyses may be performed on samples at a frequency of one for every 20 samples of similar matrix for each analysis type. If less than 20 samples are collected during a sampling event, one inorganic duplicate sample may be collected for that sample matrix.

11.3 FIELD/EQUIPMENT BLANKS

Field/equipment blanks will consist of samples of analyte-free water that are passed through and/or over decontaminated sampling equipment. These blanks will not be required if dedicated sampling equipment is utilized. The field/equipment blank samples will be subject to the same analyses as the environmental samples. One field/equipment blank will be collected for every 20 samples or one per matrix for less than 20 samples for each analysis type.

11.4 TRIP BLANKS

Trip blanks will be prepared following the same procedure used for the other VOC preservation containers and will contain analyte-free solvent, where applicable. The trip blank will undergo shipment from the sampling location to the laboratory in coolers with the environmental samples to be analyzed for VOCs. Trip blanks will be analyzed for VOCs to determine if contamination has taken place during sample handling and/or shipment. Trip blanks will be utilized for samples at a frequency of one each per shipment sent to the laboratory for VOCs.

11.5 TEMPERATURE BLANKS

Temperature blanks will consist of vials of water that have undergone shipment from the sampling location to the laboratory in coolers with the environmental samples to be analyzed for the sampling program. The temperature of these blanks will be measured at the laboratory upon receipt of the sample cooler to verify compliance with the cooler temperature requirement.

12. INSTRUMENT/EQUIPMENT TESTING AND MAINTENANCE

Preventative maintenance procedures will be carried out on field equipment by personnel in accordance with the procedures outlined in the manufacturers' specifications and/or equipment manuals. Maintenance activities involving field equipment will be recorded in the field logbook. Field equipment will be checked by qualified field representatives prior to being used in the field. Problems encountered while operating the instrument will be documented in the field logbook. If problems with operation of equipment are detected or should the equipment require service, the equipment will be returned and a qualified technician will perform the maintenance required. Use of the equipment will not be resumed until the problem is resolved.

Analytical laboratory instrumentation that will be used on this project has been documented and is on file with the laboratory. An equipment form will be prepared for each new purchase, and old forms will be removed from the instrument area and filed when an instrument is replaced.

The laboratory will be required to maintain an equipment form detailing both preventative maintenance activities and the required QA testing and monitoring. In the event an instrument does not perform within the limits specified on the monitoring form, the Laboratory Project Manager will be notified and a decision will be made as to the corrective action necessary. The corrective action procedure will be documented in the instrument log. If repair is necessary, the instrument will not be used for analyses until repairs are completed and the instrument tested. Repairs made to the instrument will be documented in the instrument logbook. Required QA/QC testing and monitoring will be completed prior to the resumption of sample analysis.

Routine maintenance is performed to keep laboratory instruments running under optimum conditions and to reduce instrument malfunction. Specific preventative maintenance programs outlining required maintenance procedures and their application frequencies are incorporated in laboratory SOPs for each methodology.

Minimally, field and laboratory instruments will undergo maintenance on an annual basis and when calibration, blanks, or QC analyses, indicate that maintenance is necessary to correct or improve system performance. Maintenance, whether performed by laboratory personnel or manufacturer, is documented as an entry in the appropriate log. Log entries will include the reason for maintenance, maintenance performed, date, and initials of person in charge during maintenance.

The operating temperatures for refrigerators, coolers, ovens, and water baths will be monitored by the laboratory daily. The analyst will record the following information in either a bound logbook, or in electronic format: equipment identification, temperature reading, date and time of reading, and analyst initials.

13. CALIBRATION AND FREQUENCY

13.1 FIELD EQUIPMENT CALIBRATION

Field equipment used during the Brownfield Area Remedial Investigation activities will be calibrated in such a manner that accuracy and reproducibility of results are consistent with the manufacturer's specifications. Equipment to be used for the field sampling will be examined to confirm that it is in good operating condition. This includes checking the manufacturer's operating manual and the instructions for each instrument to confirm that the maintenance requirements are being observed.

In general, instruments will be calibrated daily prior to use and will be recalibrated as required. All calibration procedures performed will be documented in the field logbook. Calibration will be performed at the intervals specified by the manufacturer. If an internally calibrated field instrument fails to meet calibration procedures, it will be returned to the manufacturer for service.

13.2 LABORATORY EQUIPMENT CALIBRATION

Proper calibration of laboratory analytical instrumentation is essential for the generation of reliable data that meet the project's DQOs. Analytical instrument calibration is monitored through the use of control limits that are established for individual analytical methods. Calibration procedures to be followed are specified, in detail, in the analytical methods. These procedures specify the type of calibration, calibration materials to be used, range of calibration, and frequency of calibration. The calibration requirements listed in the QC requirements and corrective actions in **Tables 3-1 through 3-8**, which augment the method requirements, are to be followed by the laboratory.

The laboratory will be responsible for proper calibration and maintenance of laboratory analytical equipment. The following subsections present general calibration procedures outlined in the analytical methods.

13.2.1 Organics

Before the GC/MS is calibrated for organics analysis, the mass calibration and resolution of the instruments are verified using 4-bromofluorobenzene (BFB) for VOCs and decafluorotriphenylphosphine (DFTPP) for SVOCs. The performance check analysis must meet the criteria referenced in the analytical method and the QAPP. The system must be verified every 12 hours of analysis and when the instrument performance check solution fails to meet criteria. Samples are not analyzed until performance check analysis criteria are met.

For organics analysis, an initial five-point calibration is performed for the target compounds prior to start-up and whenever system specifications change or if the continuing calibration acceptance criteria have not been met. The lowest calibration standard establishes the QL concentration. The method criteria, including relative response factors (RRFs) and %RSD of specific compounds, must meet established criteria as specified in the method and the QAPP. If these parameters fail to meet criteria, corrective actions must be implemented and the initial calibration must be repeated.

13.2.2 Metals and Inorganics

Instrument calibration for metal analyses is performed daily. At a minimum, a two-point calibration for inductively coupled plasma (ICP) analyses is performed. Five point calibrations are performed for cold vapor atomic absorption instruments. For non-ICP analyses, the lowest calibration standard establishes the QL concentration. The calibration curves must have correlation coefficients greater than or equal to 0.995. Calibration verification is monitored by analyzing calibration verification standards and calibration blanks following calibration and meet established criteria as specified in the method and the QAPP. To verify inter-element and background corrective factors for ICP analysis, interference check samples (ICSA and ICSAB) must be analyzed and meet established criteria as specified in the method and the QAPP.

13.2.3 Thermometers

On an annual basis, thermometers are calibrated using a certified thermometer with a traceable calibration certificate. General purpose thermometers are calibrated at three temperatures encompassing the entire operating range of the thermometer and labeled with correction factors. Thermometers are calibrated at room temperature, at ice point, at the boiling point, or above the boiling point. The maximum allowable deviation from the certified thermometer is 2°C. Any thermometer exceeding this tolerance is to be discarded.

13.3 STANDARDS AND SOLUTIONS

The use of standard materials of a known purity and quality is necessary for the generation of reproducible data. The laboratory will monitor the use of laboratory materials including solutions, standards, and reagents. Reagent solutions used for quantitation purposes must be American Chemical Society (ACS)-grade or better. Standards prepared or purchased must be traceable to National Standards of Measurement. Standards should be traceable by lot number to a certificate of analysis, which is on file at the laboratory. Standards and standard solutions are verified prior to use. This verification may be in the form of a certification of analysis from the supplier or by comparison to a standard curve or another standard from a separate source. Standards are routinely checked for signs of deterioration, including unusual volume changes, discoloration, formation of precipitates, or changes in analyte response.

Solvent materials are also verified prior to use. Each new lot of solvent is analyzed to verify the absence of interfering constituents. Reagent and method blanks are routinely analyzed to evaluate possible laboratory-based contamination of samples.

A records book will be kept for standards and will include the following information:

- Material name;
- Control or lot number;
- Purity and/or concentration;
- Supplier/manufacturer;
- Receipt/preparation date;
- Recipient/preparer name; and
- Expiration date.

These records will be checked periodically as part of the laboratory's internal laboratory controls review.

13.4. CALIBRATION RECORDS

Calibration data will be kept for each instrument that requires calibration. The data will contain a record of activities associated with QA monitoring and instrument repairs. These records will be checked during periodic equipment review and internal and external QA/QC audits.

14. INSPECTION REQUIREMENTS FOR SUPPLIES

The use of standard materials of a known purity and quality is necessary for the generation of reproducible data. The laboratory will monitor the use of laboratory consumable materials including solutions, standards, and reagents as described in **Section 13**.

Solvent materials are also verified prior to use. Each new lot of solvent is analyzed to verify the absence of interfering constituents. Reagent and method blanks are routinely analyzed to evaluate possible laboratory-based contamination of samples.

The sample containers used for this project will be supplied by the laboratory. The containers will be pre-cleaned sample containers that will be purchased from a USEPA-certified manufacturer (I-Chem 200 or equivalent container) or are cleaned using USEPA protocols. The soil vapor canisters will be individually or batch certified-clean by the laboratory, and documentation will be provided in the data package.

15. DATA ACQUISITION REQUIREMENTS

Non-direct measurement data, in the form of historical data from previous investigations, may be utilized for this Investigation.

16. DATA DELIVERABLES

For data to be scientifically valid, legally defensible, and comparable, valid procedures must be used to prepare this data. The laboratory will provide the data in an EDD format that complies with the NYSDEC's requirements. The data packages will be reported by the laboratory in NYSDEC Category B deliverables format. The laboratory will also provide the complete data packages in electronic format.

NYSDEC requires that analytical data be submitted in electronic format that can be uploaded to the NYSDEC's EQuIS database. Therefore, all data submittals from the laboratory will be submitted as an Electronic Data Deliverable (EDD) in the EQuIS 4-file format, as well as in the NYSDEC export format. It is also expected that the laboratory will use the EQuIS Data Processor checking device prior to submittal of the EDD and provide a copy of the EDP error report with the analytical results. More information regarding the NYSDEC electronic data submittals can be found at http://www.dec.ny.ny.gov/chemical/62440.html. A quick-start guide for data providers can be found on the NYSDEC website.

17. ASSESSMENT AND RESPONSE ACTIONS

17.1 PERFORMANCE AND SYSTEMS AUDITS

17.1.1 Performance Audits

At the discretion of the Project Manager, field and laboratory performance audits consisting of on-site performance evaluations may be performed during the field program and during the laboratory analysis program. These audits will evaluate the adherence of the field and laboratory programs to the QA program outlined in this QAPP. The protocols used to conduct the audits may be found in the following sections. Acceptance criteria used in determining the need for corrective action will be those criteria defined in this QAPP. The laboratory's SOPs and QAM will be consulted where acceptance criteria are not defined for laboratory procedures and analytical methods. The results of the field and laboratory audits will be documented and submitted to the Project Manager. These reports and any corrective actions that are implemented as a result of the audits will be included in the project report.

17.1.2 Laboratory Audit Protocol

The laboratory audit will investigate factors that may affect the quality of the analytical results.

The QA/QC criteria specified in this QAPP and the analytical methods must be adhered to. An on-site evaluation will be performed by the QAO or her designee. The areas of concern of the laboratory audit will include:

- Implementation of a scientifically sound QA/QC program addressing precision, accuracy, reproducibility, comparability, completeness, and blank contamination;
- Sufficient documentation and recordkeeping for technical personnel external to the laboratory to recreate each analytical event; and
- Compliance with the project requirements for laboratory analysis.

The specific parameters to be evaluated include:

- Data comparability;
- Calibration and quantitation;
- QC execution;
- Out-of-control events;
- SOPs;
- Sample management;
- Record keeping;
- Instrument calibration records;
- Other analytical records;
- QC records;
- Corrective action reports;
- Maintenance logs;
- Data review;
- MDLs and QLs;
- QC limits; and
- Analytical methods

17.1.3 Field Audit Protocol

The purpose of a field audit is to identify whether the systems and procedures described in the QAPP are operational in the field and contributing to the production of accurate and defensible analytical results. An on-

site evaluation will be performed by the Field Team Leader or a designee. The areas of concern in a field audit include:

- Sampling procedures
- Decontamination of sampling equipment, if applicable
- COC procedures
- SOPs
- Proper documentation of field methods

17.2 SYSTEM AUDITS

Routine laboratory and field performance will be monitored through the analysis of field and laboratory blanks, spiked samples, laboratory control samples, laboratory and field duplicates, and performance evaluation samples. The Laboratory Project Manager, in conjunction with the QAO and Project Manager, will formulate corrective actions in the event that QC limits specified in this document are exceeded. The results of the system audits will be documented in the project report.

17.3 CORRECTIVE ACTIONS

Corrective action procedures will be implemented based on unacceptable audit results or on detection of unacceptable data during data review performed by the laboratory and the Project Manager.

Two types of audits may be performed during the Brownfield Area Remedial Investigation activities. The data generation process will be audited by assessing adherence to control limits and by performing a laboratory audit, if requested by the Project Manager. The field program will be audited by assessing adherence to the procedures outlined in this document via analysis of field QC samples and performing an on-site field audit, if requested by the Project Manager. If required, corrective action procedures will be developed on a case-by-case basis. The enacted corrective actions will be documented in the appropriate notebook, log, or case file. File and laboratory personnel are encouraged to discuss specific issues and proposed corrective actions with the QAO.

The Field Team Leaders will be responsible for field QA. Field sampling excursions discovered during field sampling will be documented in the field logbook, and immediate corrective action will be taken. For problems or situations that cannot be solved through immediate corrective action, the Field Team Leaders will immediately notify the Project Manager, who will investigate the situation and determine who will be responsible for implementing the corrective action. Corrective action will be implemented upon approval by the Project Manager. The Project Manager will verify that the corrective action has been taken, appears effective, and at a later date, verify that the problem has been resolved. The successfully implemented corrective action will be documented in the field logbook by the Field Team Leaders. Deviations from the QA protocol in this QAPP must be justified, approved by the Project Manager, and properly documented.

The corrective actions that will be taken by the laboratory were described previously in **Section 10.9** of this QAPP.

18. QA REPORTS TO MANAGEMENT

Following completion of the Brownfield Area Remedial Investigations, the Project Manager will prepare a Remedial Investigation Report. This report will present and discuss the field and analytical data collected during the investigation. The data validation report will be submitted as an appendix to the Remedial Investigation Report.

The data validation report will be prepared under the direction of the QAO and Project Manager. The report will include data usability, and the results of any laboratory and field audits.

19. DATA REVIEW AND MANAGEMENT

19.1 DATA PRODUCTION, HANDLING, AND REPORTING

19.1.1 Laboratory Documents

Specific laboratory procedures and instrumentation can be found in the SOPs and QAM for the laboratories, which are available upon request. The general data production and reporting procedures described below will be employed at the laboratory.

19.1.2 Data Reduction

Data reduction consists of manual and computer data reduction procedures and calculations. Computer data reduction procedures and calculations will be checked manually by the laboratory to verify that compound identification and quantitation adhere to method requirements. The laboratory will be responsible for maintaining a listing of computer-based data reduction programs and SOPs for data reduction. Sample preparation and extraction records will be used to document sample preparation information (*e.g.* preparation weights, volumes, and reagents). Instrument analytical sequence records will also be maintained for each instrument. Qualitative identification and quantitation of organic and inorganic analytes will be performed by experienced analysts in accordance with analytical method requirements.

19.1.3 Laboratory Data Review

Analytical results are generally entered into the laboratory computer system by the analyst, independently reviewed by another analyst or supervisor experienced in the method, and approved by the Laboratory Project Manager. The following are requirements that are generally examined as part of this review:

- Initial calibration criteria were met. Standards in the calibration curve covered the expected concentration ranges of the samples, including the QL;
- Initial and continuing calibrations met the acceptance criteria defined in the method standard procedure;
- Sample results fell within the range of the standard curve;
- For GC/MS methods requiring internal standards, retention times and area responses were evaluated against limits established by the daily calibration;
- Method blanks were processed with each analytical batch, and no detectable levels of contamination were identified;
- The MS/MSDs were performed at the required frequency, and recoveries were within acceptable control limits;
- Duplicate analyses were performed at the required frequency, and results were within the control limits;
- The LCS analyses were performed with each analytical batch, and the results obtained were within control limits;
- For organic compound analyses, surrogate spike recoveries were within control limits;
- Compounds identified by GC/MS were manually rechecked by comparison with the data system library for both target compounds and tentatively identified compounds. Retention times and ratios of fragmentation were verified;
- Calculations have been accurately performed;
- Reporting units are correct;
- Data for the analysis provide a complete audit trail; and
- The QLs comply with data quality requirements.

The analyst's supervisor will check a minimum of 10% of the data back to raw data in the secondary review. A data package will be generated when required analyses on the samples in a project are complete, entered, and

reviewed. The data package will be forwarded to the assigned Laboratory Project Supervisor or designee for review. The data package will then be reviewed for the following items (at a minimum):

- The QC data will be reviewed to identify whether or not internal specification and contract requirements have been met; and
- Non-conformance reports, if any, will be reviewed for completion of corrective actions and their impact of results. The QC requirements and corrective actions listed in **Tables 3-1 though 3-8** in this QAPP will be referenced in the laboratory review process. Non-compliance and corrective action procedures will be documented in the case narrative.

The data package requires the signature of the Laboratory Project Supervisor or designee. Electronic data are copied onto storage media, inventoried, and stored off-site in a secure facility, or within locked cabinets on-site. This data archive system is maintained for a minimum of five years.

Following final review, two hardcopies and one electronic version of the data package will be transmitted to the Project Manager. The full deliverable data packages will document sample preparation, extraction, and analysis and include raw data and logs associated with the analyses performed for the Brownfield Area Remedial Investigation. All data deliverables from each laboratory must be paginated in ascending order. The data packages will be provided within four weeks of receipt of the last sample at the laboratory for each sampling event.

19.1.4 Data Management

Definitive data will be generated in the laboratory, and screening data will be generated in the field as described in **Section 3**. The laboratory-generated data will be entered into the laboratory database management system and presented in data packages. The laboratory will perform the data review process described in **Section 10**.

Analytical and field data will be managed in a relational DBMS. Laboratory analytical data will be provided in EDD format for direct upload into the DBMS; associated field data will be entered into the DBMS using the appropriate electronic upload format. Data validation qualifiers will be entered into the DBMS manually and checked independently. The DBMS will be used to provide custom data queries and tables to support data analysis and report preparation; data tables containing the validated sample data will be included in their corresponding investigation report.

Records will be incorporated into the final project files. Field logs, data packages, and records will be included in the project file that will be archived for a period of ten years.

20. DATA VALIDATION AND USABILITY

20.1 SCOPE OF VALIDATION

Data validation will be performed on the data collected during the Brownfield Area Remedial Investigation utilizing USEPA Region II validation guidance and NYSDEC DUSR guidance (NYSDEC, 2010) as described in the following section. Upon request by the data validator, the laboratory will provide additional or supplemental information within three working days of the request.

20.2 VALIDATION PROCEDURES

Data Validation is a process of determining the suitability of a measurement system for providing useful analytical data. Data validation is essentially a three-step process in which the analytical data's QA/QC information is first compared to a series of QA/QC criteria. Based on the results of this comparison, the analytical data are then assigned qualifiers, which provide an indication of the data's usability. Finally, an overall evaluation of the data's usability is performed.

Full validation will be performed for 100% of the samples for each matrix and each analysis type, consisting of a review of data summary forms and supportive raw analytical data provided in the data packages.

Utilizing the DUSR process as guidance, the following questions will be considered during the validation:

1. Is the data package complete as defined under the requirements for the most current DEC ASP Category B or USEPA Contract Laboratory Program (CLP) deliverables?
2. Have the holding times been met?
3. Do all the QC data: blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, duplicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?
4. Have the data been generated using established and agreed upon analytical protocols?
5. Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?
6. Have the correct data qualifiers been used?
7. Have any exceedances been specifically noted in the report?

The analytical data generated for this investigation will be evaluated using the analytical methods utilized by the laboratories (as presented in this QAPP), the QA/QC requirements listed in **Tables 3-1 to 3-8** (where applicable for each method), and professional judgment.

Data affected by excursions from the QA/QC criteria will be qualified using the following USEPA Region II data validation guidance documents or the most current documents and professional judgment.

- USEPA. 2006c. Reviewed 2009. *USEPA Region II Evaluation of Metals Data for the CLP Program, SOP HW-2 Revision 13*. New York, NY.
- USEPA. 2006d. Reviewed 2009. *USEPA Region II Validating Volatile Organic Compounds by SW-846 Method 8260B, SOP HW-24 Revision 2*. New York, NY.
- USEPA. 2006e. Reviewed 2009. *USEPA Region II Data Validation SOP of Organochlorine Pesticides by Gas Chromatography SW-846 Method 8081B, SOP HW-44 Revision 1*. New York, NY.
- USEPA. 2006f. Reviewed 2009. *USEPA Region II Data Validation SOP of PCBs by Gas Chromatography SW-846 Method 8082A, SOP HW-45 Revision 1*. New York, NY.
- USEPA. 2006g. Reviewed 2009. *Validating Volatile Organic Analysis of Ambient Air in Canister by Method TO-15. SOP HW-31, Revision 4*. Albany, NY.

- USEPA. 2009a. Reviewed 2009. *USEPA Region II Validating Semivolatile Organic Compounds by SW-846 Method 8270, SOP HW-22 Revision 4*. New York, NY.

These validation guidelines will be modified to reflect the QA/QC criteria established in this QAPP and the analytical methods utilized by the laboratories.

Data validators will be responsible for reviewing the QC parameters as listed below. For full validation, data validators will recalculate approximately 10% of the sample results using raw data and review approximately 10% of the raw data to verify that target analyte identification was performed correctly and transcription errors are not present.

Data quality will be evaluated using current laboratory control limits as provided in the data packages and data will be qualified based on excursions. Data validators will check corrective action reports and results of reanalysis if available. Corrective actions implemented by the laboratory will be evaluated during the validation process.

In accordance with the USEPA guidance and utilizing professional judgment, the following qualifiers will be used in the data validation:

"R" Indicates that the QL or sample result is determined to be unusable due to a major deficiency in the data generation process. The data should not be used for any qualitative or quantitative purposes.

"U" Indicates that the analyte was analyzed for, but a concentration was not detected. The sample QL is reported. This qualifier is also used in the validation process to signify that the detection limit of an analyte was revised due to blank contamination.

"J" Indicates that the concentration should be considered approximate. This qualifier is used when the data validation process identifies a deficiency in the data generation process. This qualifier is also applied by the laboratory when the analyte concentration is greater than the MDL but less than the QL. In the latter case, the identification of the analyte is not in question but the quantitation of the analyte concentration may be uncertain.

"UJ" Indicates that the analyte was analyzed for, but a concentration was not detected. The sample QL is reported and should be considered approximate. This qualifier is used when the data validation process identifies a deficiency in the data generation process.

"JN" Indicates that there is presumptive evidence that the analyte is present, but it has not been confirmed due to confirmation excursions.

The following guidelines will be used regarding the assignment of qualifiers and the evaluation of data. The data quality evaluation results in only one type of qualifier ("U", "J", "UJ," or "R") for each analyte. In a case when several qualifiers are applicable for the same analyte, the cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers. For example, the final data qualifier is the "R" qualifier if a sample result is affected by low surrogate recoveries, for which the "UJ" qualifier is applied, but low MS/MSD recoveries result in the rejection of the sample result (application of the "R" qualifier).

The following parameters will be included in the full validation for organic and inorganic analyses, where applicable for each analysis method, unless otherwise noted:

- QAPP compliance;
- COC records;
- Sample collection and sample preservation;
- Canister evaluations;
- Percent solids;
- Holding times;
- GC/MS tuning criteria;

- Instrument performance;
- Calibration;
- Analytical sequence;
- Blank analysis;
- Surrogate recovery;
- Recovery standard analysis;
- MS/MSD analysis;
- Laboratory duplicate analysis;
- Field duplicate analysis;
- LCS or MSB analysis;
- ICP interference check sample analysis;
- ICP serial dilution analysis;
- Internal standards performance;
- Target analyte identification, quantitation, and QLs;
- Confirmation analysis; and
- Deliverables and documentation completeness.

Unless requested, TICs for VOC and SVOC analyses will not be evaluated as part of the validation process.

20.3 DATA USABILITY EVALUATION

Based on the QA/QC information review and the qualifiers assigned to the analytical data, an overall evaluation of the data's usability will be performed. Data usability is defined as the percentage of data that remains unqualified or is qualified as approximate or non-detected due to blank contamination, divided by the data reported by the laboratory times 100. The percentage usability excludes the data qualified as rejected due to major QA/QC excursions. The non-usable data are defined as the percentage of the data qualified as rejected divided by the data reported by the laboratory times 100. The data usability will be provided for each the complete data set for this project.

The data usability evaluation considers the data parameters of precision, sensitivity, accuracy, representativeness, comparability, and completeness, which are described as follows:

- Precision is evaluated through the review of field duplicate samples, laboratory duplicates, and MS/MSD samples;
- Sensitivity is evaluated through the review of QLs;
- Accuracy is evaluated through the review of MS/MSD recoveries, MSB recoveries, internal standards, surrogate recoveries, LCS recoveries, calibration, instruction performance check, ICP interference check analysis, and ICP serial dilutions;
- Representativeness is evaluated through the review of holding times, sample preservation and preparation, blank analysis, and target compound identification and quantification;
- Comparability is evaluated through the review of the analytical methods and reporting procedures for consistency; and
- Completeness is defined as the overall percentage of sample results that are determined to be usable.

20.4 DATA USABILITY SUMMARY REPORT

The DUSR will contain separate QA sections in which data quality information collected during the investigation is summarized. The DUSR will include the following:

- Guidelines used to evaluate the data;
- Data qualifiers applied to sample results;
- Summary of samples collected and analyses performed;
- Narrative that identifies major and minor analysis excursions detected for each parameter evaluated for each analysis;
- Additional issues and information that may be beneficial to the data user are discussed;
- Data summary forms; and
- Data usability.

The DUSR will be prepared by the QAO, or his or her designee. The QAO or designee will be independent of the laboratory performing the analyses, and independent from any direct involvement with the project (e.g. Project Manager or property owner).

21. RECONCILIATION WITH USER REQUIREMENTS

Sample results from the Brownfield Area Remedial Investigation will be reviewed by the Project Manager. Data usability with respect to the DQOs and data uses will be compared to the project requirements. Samples will be recollected at the discretion of the Project Manager in the event that the completeness objective of 95% is not achieved due to major QC deviations in the sample analysis process.

REFERENCES

AWWA, APHA, and WEF. 1998. *Standard Methods for the Examination of Water and Wastewater, 20th Edition*. Washington, D.C

NYSDEC. 2010. *DER-10 Technical Guidance for Site Investigation and Remediation*. Albany, NY.

USEPA. 1988. *Determination of Total Organic Carbon in Sediment*, Region II, Environmental Services Division, Monitoring Management Branch, Edison, New Jersey.

USEPA. 1999. *Compendium Method TO-15: Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)*. Cincinnati, OH.

USEPA. 2004. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IIIB*. Washington D.C.

USEPA, 2006a. *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5)*. Washington, D.C.

USEPA, 2006b. *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*. Washington, D.C.

USEPA. 2006c. *USEPA Region II Evaluation of Metals Data for the CLP Program, SOP HW-2 Revision 13*. New York, NY.

USEPA. 2006d. *USEPA Region II Validating Volatile Organic Compounds by SW-846 Method 8260B, SOP HW-24 Revision 2*. New York, NY.

USEPA. 2006e. *USEPA Region II Data Validation SOP of Organochlorine Pesticides by Gas Chromatography SW-846 Method 8081B, SOP HW-44 Revision 1*. New York, NY.

USEPA. 2006f. *USEPA Region II Data Validation SOP of PCBs by Gas Chromatography SW-846 Method 8082A, SOP HW-45 Revision 1*. New York, NY.

USEPA. *2006g. Validating Volatile Organic Analysis of Ambient Air in canister by Method TO-15, SOP HW-31, Revision 4*. Albany, NY.

USEPA. 2007. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846,* 3rd Edition, Update IV. Washington D.C.

USEPA. 2009a. *USEPA Region II Validating Semivolatile Organic Compounds by SW-846 Method 8270, SOP HW-22 Revision 4*. New York, NY.

TABLE 1 – FIELD SAMPLING SUMMARY

Parameter and Method	Matrix	Sample Containers and Volumes	Preservation[9]	Holding Times	Number of Samples	QC Sample Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Volatile Organic Compounds by USEPA Methods 5030B/5035A/8000C /8260B/8260C[1,2]	Groundwater	3- 40-milliliter glass vials with Teflon® lined septum caps	4°C HCL to pH≤2 FC Sealed and Headspace Free	Analysis within 14 days from collection for preserved samples. Analysis within 7 days from collection for samples not acid preserved.	TBD	One per 20 samples or one per matrix (for less than 20 samples)	1 each in cooler with VOC samples	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Vinyl chloride and styrene by USEPA Methods 5030B/5035A/8000C /8260B/8260C[1,2]	Groundwater	3 - 40-milliliter glass vials with Teflon® lined septum caps	4°C Unpreserved	Analysis within 7 days from collection for unpreserved samples.	TBD	One per 20 samples or one per matrix (for less than 20 samples)	1 each in cooler with VOC samples	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Volatile Organic Compounds Low Level by USEPA Methods 5035A/8000C/8260B /8260C[1,2]	Soil, Sediment	125 mm wide mouth glass container sealed with Teflon® lined lid; or 3-Encore™ samplers used to collect and transport sample in accordance with USEPA Method 5035A.	4°C Sealed and Headspace Free	Analysis within 14 days of collection. For Encore™ sampler: extrude sample to a sealed vial and freeze to -7°C within 48 hours from collection. Analysis must be performed within 14 days from collection. Otherwise, 48 hours from collection to analysis.	TBD	One per 20 samples or one per matrix (for less than 20 samples)	1 each in cooler with VOC samples	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix

TABLE 1 – FIELD SAMPLING SUMMARY

Parameter and Method	Matrix	Sample Containers and Volumes	Preservation[9]	Holding Times	Number of Samples	QC Sample Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Volatile Organic Compounds Medium Level by USEPA Methods 5035A/8000C/8260B /8260C[1,2]	Soil, Sediment	125 mm wide mouth glass container sealed with Teflon® lined lid; or 3-Encore™ samplers in accordance with USEPA Method 5035A.	4°C Sealed and Headspace Free	Analysis within 14 days of collection. For Encore™ sampler: within 48 hours of collection: For Encore sampler: extrude sample to a sealed vial. Add methanol solution to 5 grams of sample in accordance with USEPA Method 5035A. 14 days from collection to analysis.	TBD	One per 20 samples or one per matrix (for less than 20 samples)	One ea. per cooler with VOC samples. Methanol preservation trip blank.	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Volatile Organic Compounds by USEPA Method 624[8]	Groundwater	4-40 milliliter glass vials with Teflon® lined septum caps	4°C HCL to pH≤2 RC	Analysis within 14 days from collection for preserved samples	TBD	One per 20 samples or one per matrix (for less than 20 samples)	1 each in cooler with VOC samples	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Volatile Organic Compounds by USEPA Method TO15[3]	Soil Vapor	6.0 Liter SUMMA® vacuum canisters	None	Analysis within 30 days from collection to analysis. Used and un-used canisters must be returned to the laboratory within 15 days of shipment of the canisters to the sampling location.	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	NA	One per 20 samples or one per sampling event as required for each matrix

TABLE 1 – FIELD SAMPLING SUMMARY

Parameter and Method	Matrix	Sample Containers and Volumes	Preservation[9]	Holding Times	Number of Samples	QC Sample Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Glycols and alcohols by USEPA Methods 8000C/8015B[1]	Groundwater	1-one liter amber glass container with Teflon® lined screw caps	4°C	14 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	1 each in cooler with VOC samples[10]	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Glycols and alcohols by USEPA Methods 8000C/8015B[1]	Soil, Sediment	1- 250 milliliter wide mouth glass container with Teflon® lined lid. 100 grams sample volume required	4°C	14 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	1 each in cooler with VOC samples[10]	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Semivolatile Organic Compounds by USEPA Methods 3510C/3520C/8000C /8270C/8270D[1,2]	Groundwater	1-one liter amber glass container with Teflon® lined screw caps	4°C	7 days from collection to extraction; 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Semivolatile Organic Compounds (USEPA Methods 3541/3550B/8000C/ 8270C/8270D)[1,2]	Soil, Sediment	1- 250 milliliter wide mouth glass container with Teflon® lined lid. 100 grams sample volume required	4°C	14 days from collection to extraction; 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Organochlorine Pesticides by USEPA Methods 3510C/3520C/8081A /8081B[1]	Groundwater	1-one liter amber glass container with Teflon® lined screw caps	4°C	7 days from collection to extraction; 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix

TABLE 1 – FIELD SAMPLING SUMMARY

Parameter and Method	Matrix	Sample Containers and Volumes	Preservation[9]	Holding Times	Number of Samples	QC Sample Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Organochlorine Pesticides by USEPA Methods 3541/3550B/8081A/ 8081B[1]	Soil, Sediment	1- 250 milliliter wide mouth glass container with Teflon® lined lid. 100 grams sample volume required	4°C	14 days from collection to extraction; 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Polychlorinated Biphenyls by USEPA Method 3510C/3520C/8000C /8082/8082A[1,2]	Groundwater	1-one liter amber glass container with Teflon® lined screw caps	4°C	None Recommended Holding Time: 7 days from collection to extraction; 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Polychlorinated Biphenyls by USEPA Method 3541/3550B/8000C/ 8082/8082A[1,2]	Soil, Sediment	1- 250 milliliter wide mouth glass container with Teflon® lined lid. 100 grams sample volume required.	4°C	None Recommended Holding Time: 14 days from collection to extraction; 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Metals by USEPA Methods 3005A/6010B/6010C /6020/6020A[1,2]	Groundwater	1- 1000 milliliter polyethylene or fluorocarbon (TFE or PFA) container. 100 milliliters sample volume required.	4°C HNO_3 to pH<2	180 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Metals by USEPA Methods 3050B/6010B/6010C /6020/6020A[1,2]	Soil, Sediment	4 ounce wide mouth polyethylene or fluorocarbon (TFE or PFA) container. 50 grams sample volume required.	4°C	180 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix

TABLE 1 – FIELD SAMPLING SUMMARY

Parameter and Method	Matrix	Sample Containers and Volumes	Preservation[9]	Holding Times	Number of Samples	QC Sample Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Mercury by USEPA Method 7470A[1]	Groundwater	1-250 milliliter polyethylene or fluorocarbon (TFE or PFA) container. 200 milliliters sample volume required.	4°C HNO_3 to pH<2	28 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Mercury by USEPA Method 7471A/7471B[1]	Soil, Sediment	4 ounce wide mouth polyethylene or fluorocarbon (TFE or PFA) container. 50 grams sample volume required.	4°C	28 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Total Cyanide by USEPA Method 9012A/9012B/9014[1]	Groundwater	1-1000 milliliter polyethylene or fluorocarbon (TFE or PFA) container. 500 milliliters sample volume required.	4°C NaOH to pH≥12 OA	14 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Total Cyanide by USEPA Method 9012A/9012B/9014[1]	Soil, Sediment	4 ounce wide mouth glass container with Teflon® lined lid. 100 grams sample volume required.	4°C	14 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Hexavalent Chromium by USEPA Methods 3060A/7199[1]	Soil, Sediment	4 ounce wide mouth glass container with Teflon® lined lid. 100 grams sample volume required.	4°C	30 days from collection to extraction. Analysis within 7 days from extraction.	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix

TABLE 1 – FIELD SAMPLING SUMMARY

Parameter and Method	Matrix	Sample Containers and Volumes	Preservation[9]	Holding Times	Number of Samples	QC Sample Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Hexavalent Chromium by USEPA Method 7196A [1]	Groundwater	1-250 milliliter polyethylene or fluorocarbon (TFE or PFA) container. 200 milliliters sample volume required.	4°C	24 hours from collection to analysis.	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Ammonia by USEPA Method 350.1[6]	Soil, Sediment	4 ounce wide mouth glass container with Teflon® lined lid. 50 grams sample volume required.	4°C	28 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Ammonia by USEPA Method 350.1[6]	Groundwater	One -1000 milliliter polyethylene bottle 500 milliliters sample volume required	4°C H_2SO_4 to pH<2	28 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Nitrate by USEPA Method 353.2[6]	Groundwater	One-250 milliliter polyethylene or fluorocarbon (TFE or PFA) container. 50 milliliters sample volume required.	4°C	48 hours from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix

TABLE 1 – FIELD SAMPLING SUMMARY

Parameter and Method	Matrix	Sample Containers and Volumes	Preservation[9]	Holding Times	Number of Samples	QC Sample Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Nitrate by USEPA Method 353.2[6]	Soil, Sediment	4 ounce wide mouth glass container with Teflon® lined lid. 50 grams sample volume required.	4°C	48 hours from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Nitrite by USEPA Method 353.2[6]	Groundwater	One-250 milliliter polyethylene or fluorocarbon (TFE or PFA) container. 50 milliliters sample volume required.	4°C	48 hours from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Nitrite by USEPA Method 353.2[6]	Soil, Sediment	4 ounce wide mouth glass container with Teflon® lined lid. 50 grams sample volume required.	4°C	48 hours from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Sulfate by USEPA Method 300.0[7]	Groundwater	1-500 milliliter polyethylene or fluorocarbon (TFE or PFA) container. 50 milliliters sample volume required.	4°C	28 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix

TABLE 1 – FIELD SAMPLING SUMMARY

Parameter and Method	Matrix	Sample Containers and Volumes	Preservation[9]	Holding Times	Number of Samples	QC Sample Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Sulfate by USEPA Method 300.0[7]	Soil, Sediment	4 ounce wide mouth glass container with Teflon® lined lid. 50 grams sample volume required.	4°C	28 days from collection to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Percent Solids by SM20 2540B[4]	Soil, Sediment	8 ounce wide mouth glass container with Teflon® lined lid. 50 grams sample volume required.	4°C	NA	78	NA	NA	NA	NA
TOC by USEPA Lloyd Kahn Method[5]	Sediment	14-ounce wide mouth glass container with Teflon® lined lid	4°C	28 days from collection to analysis	See Work Plan	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
pH by SM 4500H+B[4]	Groundwater	1-100 milliliter plastic bottle. 50 milliliters sample volume required.	4°C	48 hours from collection to analysis	See Work Plan	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix

NOTES:

MS/MSD indicates matrix spike/matrix spike duplicate sample for organic analyses. Spike duplicate may be performed for inorganic analyses.

Field blank is required at a frequency of one per 20 samples or one per sampling event if less than 20 samples are collected, for each matrix type. Field blank is not required if disposable equipment is used.

FC indicates that if free chlorine is present in samples, it must be removed by the appropriate addition of sodium thiosulfate or ascorbic acid.

RC indicates that if residual chlorine is present in samples, add sodium thiosulfate to the sample container before filling.

TABLE 1 – FIELD SAMPLING SUMMARY

Parameter and Method	Matrix	Sample Containers and Volumes	Preservation[9]	Holding Times	Number of Samples	QC Sample Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank

HCL indicates hydrochloric acid.

HN03 indicates nitric acid.

NaOH indicates sodium hydroxide.

Method References:

1. USEPA. 2004. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846,* 3rd Edition, Update IIIB. Washington D.C.
2. USEPA. 2007. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846,* 3rd Edition, Update IV. Washington D.C.
3. USEPA. 1999. *Compendium Method TO-15: Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS).* Cincinnati, Ohio.
4. AWWA, APHA, and WEF. 1998. *Standard Methods for the Examination of Water and Wastewater*, 20th Edition. Washington, D.C
5. USEPA. 1988. *Determination of Total Organic Carbon in Sediment*, Region II, Environmental Services Division, Monitoring Management Branch, Edison, New Jersey.
6. USEPA. 1983. *Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-79-020. Cincinnati, Ohio.
7. USEPA. 1993. *Methods for the Determination of Inorganic Substances in Environmental Samples,* EPA-600/R-93/100. Washington, D.C.
8. USEPA. 2001. *40 CFR Part 136, Appendix A*. Washington, D.C.

9- Comment 113.

10- Comment 123.

Source: O'Brien & Gere

Table 2-1A. LABORATORY DETECTION LIMITS AND REGULATORY CRITERIA FOR VOCS

Target Analytes	CAS Number	USEPA Method	Laboratory QL Aqueous (µg/L)	Laboratory MDL Aqueous (µg/L)	Laboratory QL Low Level Solid (µg/Kg)	Laboratory MDL - Low Level Solid (µg/Kg)	Laboratory QL Medium Level Solid (µg/Kg)	Laboratory MDL Medium Level Solid (µg/Kg)	Class GA Groundwater (µg/L)	Part 375 Commercial SCOs (µg/Kg)	Part 375 Industrial SCOs (µg/Kg)	Part 375 Protect. Of Groundwater (µg/Kg)
VOCs - TCL - SOMO1.2												
1,1,1-Trichloroethane	71-55-6	8260B (1)	1	0.82	5	0.363	100	27.7	5	500,000	1,000,000	680
1,1,2,2-Tetrachloroethane	79-34-5	8260B (1)	1	0.21	5	0.811	100	16.24	5	NA	NA	600
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	8260B (1)	1	0.31	5	1.14	100	50	5	NA	NA	6,000
1,1,2-Trichloroethane	79-00-5	8260B (1)	1	0.23	5	0.65	100	21	1	NA	NA	NA
1,1-Dichloroethane	75-34-3	8260B (1)	1	0.38	5	0.61	100	30.9	5	240,000	480,000	270
1,1-Dichloroethene	75-35-4	8260B (1)	1	0.29	5	0.612	100	34.6	5	500,000	1,000,000	330
1,2,3-Trichlorobenzene	87-61-6	8260B (1)	1	0.41	5	0.531	100	46	5	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	8260B (1)	1	0.41	5	0.304	100	37.9	5	NA	NA	3,400
1,2,4-Trimethylbenzene	95-63-6	8260B (1)	1	0.75	5	0.96	100	27.9	5	190,000	380,000	3,600
1,2-Dibromo-3-chloropropane	96-12-8	8260B (1)	1	0.39	5	2.5	100	50	0.04	NA	NA	NA
1,2-Dibromoethane	106-93-4	8260B (1)	1	0.73	5	0.642	100	3.8	0.0006	NA	NA	NA
1,2-Dichlorobenzene	95-50-1	8260B (1)	1	0.79	5	0.391	100	25.5	3	500,000	1,000,000	1,100
1,2-Dichloroethane	107-06-2	8260B (1)	1	0.21	5	0.251	100	40.9	0.6	30,000	60,000	20
1,2-Dichloropropane	78-87-5	8260B (1)	1	0.72	5	2.5	100	16.2	1	NA	NA	NA
1,3-Dichlorobenzene	541-73-1	8260B (1)	1	0.78	5	0.257	100	26.7	3	280,000	560,000	2,400
1,3,5-Trimethylbenzene	108-67-8	8260B (1)	1	0.77	5	0.322	100	30.2	5	190,000	380,000	8,400
1,4-Dichlorobenzene	106-46-7	8260B (1)	1	0.84	5	0.7	100	14	3	130,000	250,000	1,800
1,4-Dioxane	123-91-1	8260B (1)	40	9.32	200	24.1	4000	2310	NA	130,000	250,000	100
2-Butanone (Methylethyl ketone)	78-93-3	8260B (1)	10	1.32	25	1.83	500	297	50*	500,000	1,000,000	120
2-Hexanone	591-78-6	8260B (1)	5	1.24	25	2.5	500	205	50*	NA	NA	NA
2-Nitropropane	79-46-9	8260B (1)	5	2.2	25	6.8	500	54	NA	NA	NA	NA
4-Methyl-2-pentanone (methyl isobutyl ketone MIBK)	108-10-1	8260B (1)	5	2.1	25	1.64	500	32	NA	NA	NA	1,000
Acetone	67-64-1	8260B (1)	10	3	25	4.21	500	411	50*	500,000	1,000,000	50
Acetonitrile	75-05-8	8260B (1)	40	26	200	30.8	4000	2609	NA	NA	NA	NA
Benzene	71-43-2	8260B (1)	1	0.41	5	0.245	100	4.8	1	44,000	89,000	60
Bromochloromethane	74-97-5	8260B (1)	1	0.87	5	0.361	100	36.1	5	NA	NA	NA
Bromodichloromethane	75-27-4	8260B (1)	1	0.39	5	0.67	100	20	50*	NA	NA	NA
Bromoform	75-25-2	8260B (1)	1	0.26	5	2.5	100	50	50*	NA	NA	NA
Bromomethane	74-83-9	8260B (1)	1	0.69	5	0.45	100	22	5	NA	NA	NA
n-Butanol (n-butyl alcohol)	71-36-3	8260B (1)	40	8.85	200	94	4000	1510	50*	NA	NA	NA
tert - butanol	75-65-0	8260B (1)	20	14	100	63	2000	1230	NA	NA	NA	NA
Butylbenzene	104-51-8	8260B (1)	1	0.64	5	0.435	100	29.2	5	500,000	1,000,000	12,000
sec-Butylbenzene	135-98-8	8260B (1)	1	0.75	5	0.435	100	36.8	5	500,000	1,000,000	11,000
tert-Butylbenzene	98-06-6	8260B (1)	1	0.81	5	0.52	100	27.8	5	500,000	1,000,000	5,900
Carbon disulfide	75-15-0	8260B (1)	1	0.19	5	2.5	100	45.5	60*	NA	NA	2,700
Carbon tetrachloride	56-23-5	8260B (1)	1	0.27	5	0.484	100	25.5	5	22,000	44,000	760
Chlorobenzene	108-90-7	8260B (1)	1	0.75	5	0.66	100	13.2	5	500,000	1,000,000	1,100
Chlorodifluoromethane	75-45-6	8260B (1)	1	0.26	5	2.6	100	31.8	NA	NA	NA	NA
Chloroethane	75-00-3	8260B (1)	1	0.32	5	1.13	100	20.8	5	NA	NA	1,900
Chloroform	67-66-3	8260B (1)	1	0.34	5	0.309	100	68.6	7	350,000	700,000	370
Chloromethane	74-87-3	8260B (1)	1	0.35	5	0.302	100	23.8	5	NA	NA	NA
cis-1,2-Dichloroethene	156-59-2	8260B (1)	1	0.81	5	0.64	100	27.6	5	500,000	1,000,000	250
cis-1,3-Dichloropropene	10061-01-5	8260B (1)	1	0.36	5	0.72	100	23.9	0.4	NA	NA	NA
Cyclohexane	110-82-7	8260B (1)	1	0.18	5	0.7	100	22.2	NA	NA	NA	NA
Cylcohexanone	108-94-1	8260B (1)	10	5.2	50	18	1000	884	NA	NA	NA	NA
Dibromochloromethane	124-48-1	8260B (1)	1	0.32	5	0.64	100	48.4	50*	NA	NA	NA
Dichlorodifluoromethane	75-71-8	8260B (1)	1	0.68	5	0.413	100	43.6	5	NA	NA	NA
Diethyl ether	60-29-7	8260B (1)	1	0.72	25	2.1	500	58.1	NA	NA	NA	NA
Ethyl Acetate	141-78-6	8260B (1)	1	0.66	5	0.348	100	52.2	NA	NA	NA	NA
Ethylbenzene	100-41-4	8260B (1)	1	0.74	5	0.345	100	29.1	5	390,000	780,000	1,000
Heptane	142-82-5	8260B (1)	20	0.42	100	2.7	100	12	NA	NA	NA	NA
Hexane	110-54-3	8260B (1)	10	0.4	50	2.9	1000	25.4	NA	NA	NA	NA
Isobutanol	78-83-1	8260B (1)	40	20	200	50.6	4000	2690	NA	NA	NA	NA
Isopropylbenzene	98-82-8	8260B (1)	1	0.79	5	0.754	100	15	5	NA	NA	2,300
p-Isopropyl toluene	99-87-6	8260B (1)	1	0.31	5	0.401	100	33.7	5	NA	NA	10,000
Methyl acetate	79-20-9	8260B (1)	1	0.5	5	0.93	100	47.6	NA	NA	NA	NA

Table 2-1A. LABORATORY DETECTION LIMITS AND REGULATORY CRITERIA FOR VOCS

Target Analytes	*CAS Number*	*USEPA Method*	*Laboratory QL Aqueous (µg/L)*	*Laboratory MDL Aqueous (µg/L)*	*Laboratory QL Low Level Solid (µg/Kg)*	*Laboratory MDL - Low Level Solid (µg/Kg)*	*Laboratory QL Medium Level Solid (µg/Kg)*	*Laboratory MDL Medium Level Solid (µg/Kg)*	*Class GA Groundwater (µg/L)*	*Part 375 Commercial SCOs (µg/Kg)*	*Part 375 Industrial SCOs (µg/Kg)*	*Part 375 Protect. Of Groundwater (µg/Kg)*
Methyl tert-butyl ether	1634-04-4	8260B (1)	1	0.16	5	0.491	100	37.8	10*	500,000	1,000,000	930
Methylcyclohexane	108-87-2	8260B (1)	1	0.16	5	0.76	100	46.8	NA	NA	NA	NA
Methylene chloride	75-09-2	8260B (1)	1	0.44	5	2.3	100	19.8	5	500,000	1,000,000	50
Naphthalene	91-20-3	8260B (1)	1	0.43	5	0.67	100	33.7	10*	500,000	1,000,000	12,000
Styrene	100-42-5	8260B (1)	1	0.73	5	0.25	100	24.1	5	NA	NA	NA
Tetrachloroethene	127-18-4	8260B (1)	1	0.36	5	0.671	100	13.44	5	150,000	300,000	1,300
Tetrahydrofuran	109-99-9	8260B (1)	5	1.25	25	4.6	500	258	50*	NA	NA	NA
Toluene	108-88-3	8260B (1)	1	0.51	5	0.378	100	26.8	5	500,000	1,000,000	700
trans-1,2-Dichloroethene	156-60-5	8260B (1)	1	0.9	5	0.516	100	23.6	5	500,000	1,000,000	190
trans-1,3-Dichloropropene	10061-02-6	8260B (1)	1	0.37	5	2.2	100	4.8	0.4	NA	NA	NA
Trichloroethene	79-01-6	8260B (1)	1	0.46	5	1.1	100	27.8	5	200,000	400,000	470
Trichlorofluoromethane	75-69-4	8260B (1)	1	0.88	5	0.473	100	46.9	5	NA	NA	NA
Vinyl chloride	75-01-4	8260B (1)	1	0.9	5	0.61	100	33.5	2	13,000	27,000	20
m,p-Xylene	108-38-3/ 106-42-3	8260B (1)	2	0.66	10	0.84	200	55.4	5**	NA	NA	NA
o-Xylene	95-47-6	8260B (1)	1	0.76	5	0.653	100	13	5**	NA	NA	NA
Xylenes (total)	1330-20-7	8260B (1)	2	0.66	10	0.84	200	16.8	5	500,000	1,000,000	1,600
Other Analytes												
Isopropyl Alcohol	67-63-0	8015B (1)	1000	120	1000	242	NA	NA	NA	NA	NA	NA
Ethanol	64-17-5	8015B (1)	1000	140	1000	150	NA	NA	NA	NA	NA	NA
Ethylene Glycol	107-21-1	8015B (1)	10000	760	5000	1100	NA	NA	50*	NA	NA	NA
Methanol (methyl alcohol)	67-56-1	8015B (1)	1000	409	1000	298	NA	NA	NA	NA	NA	NA
Propylene Glycol	57-55-6	8015B (1)	10000	760	5000	1000	NA	NA	1000*	NA	NA	NA
Amyl Acetate	628-63-7	624 (2)	5	0.36	NA	NA	NA	NA	NA	NA	NA	NA
n-Butyl Acetate	123-86-4	624 (2)	5	0.49	NA	NA	NA	NA	NA	NA	NA	NA
Targeted Tentatively Identified Compounds (TICs) for Method 8260B												
Acetyl Bromide	506-96-7	8260B (1)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Amyl Acetate	628-63-7	8260B (1)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloropentafluoroethane	76-15-3	8260B (1)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorotrifluoromethane	75-72-9	8260B (1)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl Acrylate	140-88-5	8260B (1)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylene Oxide	75-21-8	8260B (1)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isobutyl Acetate	110-19-0	8260B (1)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butyl Acetate	123-86-4	8260B (1)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

QL indicates quantitation limit.

MDL indicate method detection limit.

QLs and MDLs will be provided by the laboratory selected.

Target compound list (TCL) resource - USEPA Method SOMO1.2

ug/L indicates micrograms per Liter.

ug/Kg indicates micrograms per kilogram.

Method reference:

1. United States Environmental Protection Agency (USEPA). 2004. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods,* SW-846, 3rd Edition, Update IIIB. Washington D.C.

2. USEPA. 2001. *40 CFR Part 136, Appendix A.* Washington, D.C.

Regulatory criteria and notes:

Soil Criteria from 6NYCRR Part 375 *Environmental Remediation Programs* ; Effective December 14, 2006, Current as of August 2012.

Class GA Groundwater Standards and Guidance values as listed in T.O.G.S 1.1.1; *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* ; June 1998, current as of August 2012.

*-Guidance values not standards.

** 5 ug/L is the criteria for total Xylenes

NA- actions limits are not available.

Table 2-1B LABORATORY DETECTION LIMITS FOR VOCS IN SOIL VAPOR					
				Soil Vapor and Subslab Soil	Soil Vapor and Subslab Soil
				Laboratory QL Air	Laboratory QL Air
Target Analyte	**USEPA Method**	**CAS #**	**M.W.**	**ppbv**	**ug/m3**
Acetone	TO-15 (1)	67-64-1	58.08	5	12
Benzene	TO-15 (1)	71-43-2	78.11	0.2	0.64
Bromodichloromethane	TO-15 (1)	75-27-4	163.83	0.2	1.3
Bromoethene	TO-15 (1)	593-60-2	106.90	0.2	0.87
Bromoform	TO-15 (1)	75-25-2	252.75	0.2	2.1
Bromomethane	TO-15 (1)	74-83-9	94.94	0.2	0.78
1,3-Butadiene	TO-15 (1)	106-99-0	54.09	0.01	0.44
2-Butanone (methyl ethyl ketone) (MEK)	TO-15 (1)	78-93-3	72.11	0.5	1.5
Chlorobenzene	TO-15 (1)	108-90-7	112.55	0.2	0.92
Chloroethane	TO-15 (1)	75-00-3	64.52	0.5	1.3
Chloroform	TO-15 (1)	67-66-3	119.38	0.2	0.98
Chloromethane	TO-15 (1)	74-87-3	50.49	0.5	1
3-Chloropropene	TO-15 (1)	107-05-1	76.53	0.5	1.6
2-Chlorotoluene (o-chlorotoluene)	TO-15 (1)	95-49-8	126.60	0.2	1
Carbon disulfide	TO-15 (1)	75-15-0	76.14	0.5	1.6
Carbon tetrachloride	TO-15 (1)	56-23-5	153.81	0.04	0.25
Cyclohexane	TO-15 (1)	110-82-7	84.16	0.2	0.69
Dibromochloromethane	TO-15 (1)	124-48-1	208.29	0.2	1.7
1,2-Dibromoethane (ethylene dibromide)	TO-15 (1)	106-93-4	187.90	0.2	1.5
1,2-Dichlorobenzene (ortho)	TO-15 (1)	95-50-1	147.00	0.2	1.2
1,3-Dichlorobenzene (meta)	TO-15 (1)	541-73-1	147.00	0.2	1.2
1,4-Dichlorobenzene (para)	TO-15 (1)	106-46-7	147.00	0.2	1.2
Dichlorodifluoromethane (Freon 12)	TO-15 (1)	75-71-8	120.92	0.5	2.5
1,1-Dichloroethane	TO-15 (1)	75-34-3	98.96	0.2	0.81
1,2-Dichloroethane	TO-15 (1)	107-06-2	98.96	0.2	0.81
1,1-Dichloroethene	TO-15 (1)	75-35-4	96.94	0.2	0.79
1,2-Dichloroethene (cis)	TO-15 (1)	156-59-2	96.94	0.2	0.79
1,2-Dichloroethene (trans)	TO-15 (1)	156-60-5	96.94	0.2	0.79
1,2-Dichloroethene (total)**	TO-15 (1)	_	_	0.2	0.79
1,2-Dichloropropane	TO-15 (1)	78-87-5	112.99	0.2	0.92
1,2-Dichlorotetrafluoroethane (Freon 114)	TO-15 (1)	76-14-2	170.93	0.2	1.4
Ethylbenzene	TO-15 (1)	100-41-4	106.17	0.2	0.87
4-Ethyltoluene (p-Ethyltoluene)	TO-15 (1)	622-96-8	120.19	0.2	0.98
n-heptane	TO-15 (1)	142-82-5	100.20	0.2	0.82
Hexachlorobutadiene	TO-15 (1)	87-68-3	260.80	0.2	2.1
n-Hexane (hexane)	TO-15 (1)	110-54-3	86.17	0.20	0.70
Methylene Chloride	TO-15 (1)	75-09-2	84.93	0.5	1.7
4-Methyl-2-pentanone (MIBK)	TO-15 (1)	108-10-1	100.16	0.5	2
MTBE (methyl tert butyl ether)	TO-15 (1)	1634-04-4	88.15	0.20	0.70
Styrene	TO-15 (1)	100-42-5	104.15	0.2	0.85
Tertiary butyl alcohol (TBA)	TO-15 (1)	75-65-0	74.12	5	15
1,1,2,2-Tetrachloroethane	TO-15 (1)	79-34-5	167.85	0.2	1.4
Tetrachloroethene	TO-15 (1)	127-18-4	165.83	0.2	1.4
Toluene	TO-15 (1)	108-88-3	92.14	0.2	0.75
1,2,4-Trichlorobenzene	TO-15 (1)	120-82-1	181.50	0.5	3.7
1,1,1-Trichloroethane	TO-15 (1)	71-55-6	133.41	0.2	1.1
1,1,2-Trichloroethane	TO-15 (1)	79-00-5	133.41	0.2	1.1
Trichlorofluoromethane (Freon 11)	TO-15 (1)	75-69-4	137.40	0.2	1.1
1,1,2-Trichloro-1,2,2-trifluoroethane	TO-15 (1)	76-13-1	187.40	0.2	1.5
Trichloroethene	TO-15 (1)	79-01-6	131.39	0.04	0.25
1,2,4-Trimethylbenzene	TO-15 (1)	95-63-6	120.19	0.2	0.98
1,3,5-Trimethylbenzene	TO-15 (1)	108-67-8	120.19	0.2	0.98
2,2,4-Trimethylpentane	TO-15 (1)	540-84-1	132.38	0.2	0.93
Vinyl chloride	TO-15 (1)	75-01-4	62.50	0.04	0.25
Xylenes (m&p)	TO-15 (1)	1330-20-7	106.17	0.5	2.2
Xylenes (o)	TO-15 (1)	95-47-6	106.17	0.2	0.87
Xylenes (total)***	TO-15 (1)	_	_	0.2	0.87
1,4-Dioxane	TO-15 (1)	123-91-1	88.11	5	18
Isopropyl Alcohol	TO-15 (1)	67-63-0	60.10	5	12
Methyl Butyl Ketone	TO-15 (1)	591-78-6	100.20	0.5	2
Methyl methacrylate	TO-15 (1)	80-62-6	100.12	0.5	2
Naphthalene	TO-15 (1)	91-20-3	126.18	0.5	2.6
Tetrahydrofuran	TO-15 (1)	109-99-9	72.10	5	15

Notes:

QL indicates quantitation limit.

Target list resource - Project Target list

$\mu g/m^3$ indicates microgram per cubic meter.

ppbv indicates parts per billion by volume.

* indicates Indicates that the laboratory will report the results to the QL level only.

** indicates the concentrations of each isomer are added if multiple isomers are present and the results compared to the total screening level.

QLs will be provided by the laboratory selected.

Method reference:

1. United States Environmental Protection Agency (USEPA). 1999. *Compendium Method TO-15: Determination of Volatile Organic Compounds(VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS).* Cincinnati, Ohio.

Regulatory criteria and notes:

NYSDOH Sub-slab and Indoor Air matrix from "Guidance for Evaluating Vapor Intrusion in the State of New York," NYSDOH, October 2006, Current as of October 2011.

NA- action limits are not available.

Table 2-2. LABORATORY DETECTION LIMITS AND REGULATORY CRITERIA FOR SVOCs

Target Analytes	*CAS Number*	*USEPA Method*	*Laboratory QL Aqueous (µg/L)*	*Laboratory MDL Aqueous (µg/L)*	*Laboratory QL Solid (µg/Kg)*	*Laboratory MDL - Solid (µg/Kg)*	*Class GA Groundwater (µg/L)*	*Part 375 Commercial SCOs (µg/Kg)*	*Part 375 Industrial SCOs (µg/Kg)*	*Groundwater Protection SCOs (µg/Kg)*
TCL - SOMO1.2										
1,1´-Biphenyl	92-52-4	8270C	5	0.653	170	10.51	5	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	95-94-3	8270C	5	0.58	170	15.42	5	NA	NA	NA
2,3,4,6-Tetrachlorophenol	58-90-2	8270C	5	0.32	170	170.00	1**	NA	NA	NA
2,4,5-Trichlorophenol	95-95-4	8270C	5	0.48	170	36.81	1**	NA	NA	100
2,4,6-Trichlorophenol	88-06-2	8270C	5	0.61	170	11.14	1**	NA	NA	NA
2,4-Dichlorophenol	120-83-2	8270C	5	0.51	170	8.85	1**	NA	NA	400
2,4-Dimethylphenol	105-67-9	8270C	5	0.5	170	45.60	1**	NA	NA	NA
2,4-Dinitrophenol	51-28-5	8270C	10	2.22	330	59.06	1**	NA	NA	200
2,4-Dinitrotoluene	121-14-2	8270C	5	0.447	170	26.13	5	NA	NA	NA
2,6-Dinitrotoluene	606-20-2	8270C	5	0.4	170	41.30	5	NA	NA	170
2-Chloronaphthalene	91-58-7	8270C	5	0.46	170	11.33	10*	NA	NA	NA
2-Chlorophenol	95-57-8	8270C	5	0.53	170	8.59	1**	NA	NA	NA
2-Methylnaphthalene	91-57-6	8270C	5	0.6	170	2.04	NA	NA	NA	36,400
2-Methylphenol	95-48-7	8270C	5	0.4	170	5.19	1**	500,000	1,000,000	330
2-Nitroaniline	88-74-4	8270C	10	0.42	330	54.15	5	NA	NA	400
2-Nitrophenol	88-75-5	8270C	5	0.48	170	7.72	1**	NA	NA	300
3,3´-Dichlorobenzidine	91-94-1	8270C	5	0.4	170	148.00	5	NA	NA	NA
3 & 4 -Methylphenol	NA	8270C	10	0.36	330	9.40	1**	500,000	1,000,000	330
3-Nitroaniline	99-09-2	8270C	10	0.48	330	38.81	5	NA	NA	500
4,6-Dinitro-2-methylphenol	534-52-1	8270C	10	2.2	330	58.29	1**	NA	NA	NA
4-Bromophenyl phenyl ether	101-55-3	8270C	5	0.45	170	53.71	NA	NA	NA	NA
4-Chloro-3-methylphenol	59-50-7	8270C	5	0.45	170	6.94	1**	NA	NA	NA
4-Chloroaniline	106-47-8	8270C	5	0.59	170	49.55	5	NA	NA	220
4-Chlorophenyl phenyl ether	7005-72-3	8270C	5	0.35	170	3.60	NA	NA	NA	NA
4-Nitroaniline	100-01-6	8270C	10	0.25	330	18.86	5	NA	NA	NA
4-Nitrophenol	100-02-7	8270C	10	1.52	330	40.92	1**	NA	NA	100
Acenaphthene	83-32-9	8270C	5	0.41	170	1.98	20*	500,000	1,000,000	98,000
Acenaphthylene	208-96-8	8270C	5	0.38	170	1.38	NA	500,000	1,000,000	107,000
Acetophenone	98-86-2	8270C	5	0.54	170	8.66	NA	NA	NA	NA
Aniline	62-53-3	8270C	10	0.61	330	92.44	5	500,000	1,000,000	330
Anthracene	120-12-7	8270C	5	0.28	170	4.32	50*	500,000	1,000,000	1,000,000
Atrazine	1912-24-9	8270C	5	0.46	170	7.51	7.5	NA	NA	NA
Benzaldehyde	100-52-7	8270C	5	0.267	170	18.51	NA	NA	NA	NA
Benzo[a]anthracene	56-55-3	8270C	5	0.36	170	2.91	0.002*	5,600	11,000	1,000
Benzo[a]pyrene	50-32-8	8270C	5	0.47	170	4.07	ND	1,000	1,100	22,000
Benzo[b]fluoranthene	205-99-2	8270C	5	0.34	170	3.28	0.002*	5,600	11,000	1,700
Benzo[g,h,i]perylene	191-24-2	8270C	5	0.35	170	2.03	NA	500,000	1,000,000	1,000,000
Benzo[k]fluoranthene	207-08-9	8270C	5	0.73	170	1.86	0.002*	56,000	110,000	17,000
Benzyl alcohol	100-51-6	8270C	20	0.44	330	8.07	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	111-91-1	8270C	5	0.35	170	9.18	5	NA	NA	NA
bis(2-chloroethyl)ether	111-44-4	8270C	5	0.4	170	14.57	1	NA	NA	NA
bis(2-chloroisopropyl)ether	108-60-1	8270C	5	0.52	170	17.64	5	NA	NA	NA
bis(2-Ethylhexyl)phthalate	117-81-7	8270C	5	1.8	170	54.39	5	NA	NA	435,000
Butyl benzyl phthalate	85-86-7	8270C	5	0.42	170	45.33	50*	NA	NA	122,000
Caprolactam	105-60-2	8270C	5	2.2	170	73.02	NA	NA	NA	NA
Carbazole	86-74-8	8270C	5	0.3	170	1.95	NA	NA	NA	NA
Chrysene	218-01-9	8270C	5	0.33	170	1.69	0.002*	56,000	110,000	1,000
Dibenz[a,h]anthracene	53-70-3	8270C	5	0.42	170	1.99	NA	560	1,100	1,000,000
Dibenzofuran	132-64-9	8270C	10	0.51	170	1.76	NA	350,000	1,000,000	6,200
Dicyclohexylamine (DCHA)	101-83-7	8270C	10	1.4	NA	NA	NA	NA	NA	NA
Diethyl phthalate	84-66-2	8270C	5	0.22	170	5.10	50*	NA	NA	7,100
n,n Dimethylanailine (DMA)	121-69-7	8270C	NA	NA	NA	NA	1	NA	NA	NA

Table 2-2. LABORATORY DETECTION LIMITS AND REGULATORY CRITERIA FOR SVOCs

Target Analytes	*CAS Number*	*USEPA Method*	*Laboratory QL Aqueous (µg/L)*	*Laboratory MDL Aqueous (µg/L)*	*Laboratory QL Solid (µg/Kg)*	*Laboratory MDL - Solid (µg/Kg)*	*Class GA Groundwater (µg/L)*	*Part 375 Commercial SCOs (µg/Kg)*	*Part 375 Industrial SCOs (µg/Kg)*	*Groundwater Protection SCOs (µg/Kg)*
TCL - SOMO1.2										
Dimethyl phthalate	131-11-3	8270C	5	0.36	170	4.40	50*	NA	NA	27,000
Di-n-butyl phthalate	84-74-2	8270C	5	0.31	170	58.35	50	NA	NA	8,100
Di-n-octyl phthalate	117-84-0	8270C	5	0.47	170	3.95	50*	NA	NA	120,000
Fluoranthene	206-44-0	8270C	5	0.51	170	2.45	50*	500,000	1,000,000	1,000,000
Fluorene	86-73-7	8270C	5	0.68	170	3.89	50*	500,000	1,000,000	386,000
Hexachlorobenzene	118-74-1	8270C	5	0.51	170	8.39	0.04	6,000	12,000	1,400
Hexachlorobutadiene	87-68-3	8270C	5	0.68	170	8.64	0.5	NA	NA	NA
Hexachlorocyclopentadiene	77-47-4	8270C	5	0.59	170	51.04	5	NA	NA	NA
Hexachloroethane	67-72-1	8270C	5	0.59	170	13.06	5	NA	NA	NA
Indeno[1,2,3-cd]pyrene	193-39-5	8270C	5	0.47	170	4.67	0.002*	5,600	11,000	8,200
Isophorone	78-59-1	8270C	5	0.43	170	8.44	50*	NA	NA	4,400
Naphthalene	91-20-3	8270C	5	0.76	170	2.81	10*	500,000	1,000,000	12,000
Nitrobenzene	98-95-3	8270C	5	0.29	170	7.48	0.4	69,000	140,000	170
N-Nitroso-di-n-propylamine	621-64-7	8270C	5	0.54	170	13.37	na	NA	NA	NA
N-Nitrosodiphenylamine	86-30-6	8270C	5	0.51	170	9.23	50*	NA	NA	NA
Pentachlorophenol	87-86-5	8270C	10	2.2	330	57.90	1**	6,700	55,000	800
Phenanthrene	85-01-8	8270C	5	0.44	170	3.54	50	500,000	1,000,000	1,000,000
Phenol	108-95-2	8270C	5	0.39	170	17.77	1**	500,000	1,000,000	330
Pyridine	110-86-1	8270C	25	0.41	330	94.99	50*	NA	NA	NA
Pyrene	129-00-0	8270C	5	0.34	170	1.09	50*	500,000	1,000,000	1,000,000
Triethylamine	121-44-8	8270C	NA	NA	NA	NA	NA	NA	NA	NA
Targeted Tentatively Identified Compounds (TICs)										
Cyclohexylamine	108-91-8	8270C	NA	NA	NA	NA	NA	NA	NA	NA
N,N-Dimethylformamide	68-12-2	8270C	NA	NA	NA	NA	50*	NA	NA	NA
Potassium Acetate	127-08-2	8270C	NA	NA	NA	NA	NA	NA	NA	NA
Ethylene diamine tetra acetic acid	60-00-4	8270C	NA	NA	NA	NA	NA	NA	NA	NA
Hexamethyldisilane (HMDS)	1450-14-2	8270C	NA	NA	NA	NA	NA	NA	NA	NA
Hexamethyldisiloxane (HMDSO)	107-46-0	8270C	NA	NA	NA	NA	NA	NA	NA	NA
Trimethylchlorosilane	75-77-4	8270C	NA	NA	NA	NA	NA	NA	NA	NA
Syltherm XLT (Dimethylpolysiloxane)	63148-62-9	8270C	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

QL indicates quantitation limit.

MDL indicate method detection limit.

QLs and MDLs will be provided by the laboratory selected.

Target compound list (TCL) resource - USEPA Method SOMO1.2

ug/L indicates micrograms per Liter.

ug/Kg indicates micrograms per kilogram.

Method reference:

United States Environmental Protection Agency (USEPA). 2004. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods,* SW-846, 3rd Edition, Update IIIB. Washington D.C.

Regulatory criteria and notes:

Soil Criteria from 6NYCRR Part 375 *Environmental Remediation Programs*; Effective December 14, 2006, Current as of August 2012.

Class GA Groundwater Standards and Guidance values as listed in T.O.G.S 1.1.1;*Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*; June 1998, current as of August 2012.

**- included in Phenolic Compounds which is sum of substances.

* - Guidance Criteria not standard.

NA- actions limits are not available.

Table 2-3. LABORATORY DETECTION LIMITS AND REGULATORY CRITERIA FOR PCBS AND ORGANOCHLORINE PESTICIDES

TCL Target Analyte	*CAS Number*	*USEPA Method*	*Laboratory QL Aqueous (µg/L)*	*Laboratory MDL Aqueous (µg/L)*	*Laboratory QL Solid (µg/Kg)*	*Laboratory Solid MDL (µg/Kg)*	*Class GA Groundwater (µg/L)*	*Part 375 Commercial SCOs (µg/Kg)*	*Part 375 Industrial SCOs (µg/Kg)*	*Groundwater Protection SCOs (µg/Kg)*
TCL Polychlorinated biphenyls										
Aroclor 1016	12674-11-2	8082 (1)	0.5	0.176	250	48.9	0.09**	1,000	25,000	3,200
Aroclor 1221	11104-28-2	8082 (1)	0.5	0.176	250	48.9	0.09**	1,000	25,000	3,200
Aroclor 1232	11141-16-5	8082 (1)	0.5	0.176	250	48.9	0.09**	1,000	25,000	3,200
Aroclor 1242	53469-21-9	8082 (1)	0.5	0.176	250	48.9	0.09**	1,000	25,000	3,200
Aroclor 1248	12672-29-6	8082 (1)	0.5	0.176	250	48.9	0.09**	1,000	25,000	3,200
Aroclor 1254	11097-69-1	8082 (1)	0.5	0.25	250	117	0.09**	1,000	25,000	3,200
Aroclor 1260	11096-82-5	8082 (1)	0.5	0.25	250	117	0.09**	1,000	25,000	3,200
Aroclor 1262	37324-23-5	8082 (1)	0.5	0.25	250	117	0.09**	1,000	25,000	3,200
Aroclor 1268	11100-14-4	8082 (1)	0.5	0.25	250	117	0.09**	1,000	25,000	3,200
TCL Organochlorine Pesticides										
4,4'-DDE	72-55-9	8081A (1)	0.05	0.0116	1.67	0.25	0.2	62,000	120,000	17,000
4,4'-DDT	50-29-3	8081A (1)	0.05	0.011	1.67	0.17	0.2	47,000	94,000	136,000
4.4'-DDD	72-54-8	8081A (1)	0.05	0.0092	1.67	0.324	0.3	92,000	180,000	14,000
Aldrin	309-00-2	8081A (1)	0.05	0.0066	1.67	0.41	ND	680	1,400	190
Alpha BHC	319-84-6	8081A (1)	0.05	0.0066	1.67	0.3	0.01	3,400	6,800	20
Beta BHC	319-85-7	8081A (1)	0.05	0.0248	1.67	0.18	0.04	3,000	14,000	90
Alpha Chlordane	5103-71-9	8081A (1)	0.05	0.0148	1.67	0.83	0.05	24,000	47,000	2,900
Gamma Chlordane	5103-74-2	8081A (1)	0.05	0.011	1.67	0.53	0.05	NA	NA	14,000
Delta BHC	319-86-8	8081A (1)	0.05	0.01	1.67	0.22	0.04	500,000	1,000,000	250
Dieldrin	60-57-1	8081A (1)	0.05	0.0098	1.67	0.4	0.004	1,400	2,800	100
Endosulfan I	959-98-8	8081A (1)	0.05	0.011	1.67	0.21	NA	200,000	920,000	102,000
Endosulfan II	33213-65-9	8081A (1)	0.05	0.012	1.67	0.3	NA	200,000	920,000	102,000
Endosulfan Sulfate	1031-07-8	8081A (1)	0.05	0.0157	1.67	0.311	NA	200,000	920,000	1,000,000
Endrin	72-20-8	8081A (1)	0.05	0.0138	1.67	0.23	ND	89,000	410,000	60
Endrin Aldehyde	7421-93-4	8081A (1)	0.05	0.0163	1.67	0.426	5	NA	NA	NA
Endrin Ketone	53494-70-5	8081A (1)	0.05	0.012	1.67	0.41	5	NA	NA	NA
Gamma BHC (Lindane)	58-89-9	8081A (1)	0.05	0.006	1.67	1.206	0.05	9,200	23,000	100
Heptachlor	76-44-8	8081A (1)	0.05	0.0085	1.67	0.261	0.04	15,000	29,000	380
Heptachlor Epoxide	1024-57-3	8081A (1)	0.05	0.0053	1.67	0.43	0.03	NA	NA	20
Methoxychlor	72-43-5	8081A (1)	0.05	0.0141	1.67	0.23	35	NA	NA	900,000
Toxaphene	8001-35-2	8081A (1)	0.5	0.12	16.7	9.7	0.06	NA	NA	NA

Notes:

QL indicates quantitation limit.

MDL indicate method detection limit.

QLs and MDLs will be provided by the laboratory selected.

Target compound list (TCL) resources for PCBs and pesticides - USEPA Method SOMO1.2

ug/L indicates micrograms per Liter.

ug/Kg indicates micrograms per kilogram.

Method reference:

1- USEPA. 2004. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods,* SW-846, 3rd Edition, Update IIIB. Washington D.C.

Regulatory criteria and notes:

Soil Criteria from 6NYCRR Part 375 *Environmental Remediation Programs* ; Effective December 14, 2006, Current as of August 2012.

Class GA Groundwater Standards and Guidance values as listed in T.O.G.S 1.1.1; *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* ; June 1998, Current as of August 2012.

*-Guidance values not standards.

** 0.09 is the criteria for the sum of the Aroclors

NA- actions limits are not available.

Table 2-4. LABORATORY DETECTION LIMITS AND REGULATORY CRITERIA FOR METALS AND INORGANICS

Target Analytes	CAS Number	Method (Reference)	Laboratory QL Aqueous µg/L	Laboratory MDL - Aqueous µg/L	Laboratory QL Solid mg/Kg	Laboratory MDL - Solid mg/Kg	Class GA Groundwater µg/L	Part 375 Commercial Use SCOs mg/Kg	Part 375 Industrial Use SCOs mg/Kg	Protection of Groundwater SCOs mg/Kg
TAL Metals										
Aluminum	7429-90-5	6010B/6020 (1)	200	600	10	4.4	NA	NA	NA	NA
Antimony	7440-36-0	6010B/6020 (1)	20	67.9	15	0.54	3	NA	NA	NA
Arsenic	7440-38-2	6010B/6020 (1)	10	55.5	2	0.4	25	16	16	16
Barium	7440-39-3	6010B/6020 (1)	2	7	0.5	0.11	1,000	400	10,000	820
Beryllium	7440-41-7	6010B/6020 (1)	2	3	0.2	0.028	3*	590	2,700	47
Cadmium	7440-43-9	6010B/6020 (1)	1	3.3	0.2	0.03	5	9.3	60	7.5
Calcium	7440-70-2	6010B/6020 (1)	500	1000	50	3.3	NA	NA	NA	NA
Total Chromium	7440-47-3	6010B/6020 (1)	4	8.7	0.5	0.2	50	NA	NA	NA
Hexavalent Chromium	18540-29-9	7196A (1)	2.7	10	NA	NA	50	400	800	19
Hexavalent Chromium	18540-29-9	3060A/7199 (1)	NA	NA	0.145	0.2	50	400	800	19
Trivalent Chromium	16065-83-1	NA	NA	NA	NA	NA	NA	1,500	6,800	NA
Cobalt	7440-48-4	6010B/6020 (1)	4	6.3	0.5	0.05	NA	NA	NA	NA
Copper	7440-50-8	6010B/6020 (1)	10	15	1	0.21	200	270	10,000	1,720
Iron	7439-89-6	6010B/6020 (1)	50	193	10	1.1	300	NA	NA	NA
Lead	7439-92-1	6010B/6020 (1)	5	30	1	0.24	25	1,000	3,900	450
Magnesium	7439-95-4	6010B/6020 (1)	200	434	20	0.927	35,000*	NA	NA	NA
Manganese	7439-96-5	6010B/6020 (1)	3	4	0.2	0.032	300	10,000	10,000	2,000
Mercury	7439-97-6	7470A/7471A (1)	0.2	0.12	0.02	0.0081	0.7	2.8	5.7	0.73
Molybdenum	7439-98-7	6010B/6020 (1)	10	35.6	1	0.13	NA	NA	NA	NA
Nickel	7440-02-0	6010B/6020 (1)	10	12.6	5	0.23	100	310	10,000	130
Potassium	7440-09-7	6010B/6020 (1)	500	2000	30	20	NA	NA	NA	NA
Selenium	7782-49-2	6010B/6020 (1)	15	87	4	0.57	10	1,500	6,800	4
Silver	7440-22-4	6010B/6020 (1)	3	12.3	0.5	0.2	50	1,500	6,800	8.3
Sodium	7440-23-5	6010B/6020 (1)	1000	3240	140	13	20,000	NA	NA	NA
Thallium	7440-28-0	6010B/6020 (1)	20	102.4	6	0.3	0.5*	NA	NA	NA
Vanadium	7440-62-2	6010B/6020 (1)	5	10.8	0.5	0.11	NA	NA	NA	NA
Zinc	7440-66-6	6010B/6020 (1)	10	17	2	0.153	2,000*	10,000	10,000	2,480
Total Cyanide	57-12-5	9012A/9012B/9014 (1)	10000	3	10	0.003	200	27	10,000	40
Other Analytes										
Ammonia	7664-41-7	350.1 (2)	0.02 mg/L	0.009 mg/L	4 mg/Kg	2 mg/Kg	2,000	NA	NA	NA
Nitrate	-	353.2 (2)	0.05 mg/L	0.011 mg/L	1 mg/Kg	0.02 mg/Kg	10,000	NA	NA	NA
Nitrite	-	353.2 (2)	0.05 mg/L	0.02 mg/L	1 mg/Kg	0.006 mg/Kg	1,000	NA	NA	NA
Sulfate	-	300.0 (3)	2 mg/L	0.35 mg/L	20 mg/Kg	3.5 mg/Kg	250,000	NA	NA	NA

Notes:

MDLs indicate method detection limits.

QLs indicates quantitation limits.

mg/kg indicates milligrams per kilogram.

ug/L indicates micrograms per Liter.

QLs and MDLs will be provided by laboratory selected.

Target Analyte List (TAL) resource for metals - USEPA Method ILM05.4.

Method references:

1. USEPA. 2004. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846,* 3rd Edition, Update IIIB. Washington D.C.
2. USEPA. 1983. *Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020.* Cincinnati, Ohio.
3. USEPA. 1993. *Methods for the Determination of Inorganic Substances in Environmental Samples, EPA-600/R-93/100.* Washington, D.C.

Regulatory criteria and notes:

Soil Criteria from 6NYCRR Part 375 *Environmental Remediation Programs*; Effective December 14, 2006, Current as of August 2012.

Class GA Groundwater Standards and Guidance values as listed in T.O.G.S 1.1.1; *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*; June 1998, Current as of August 2012.

* - Guidance value not standard.

NA- actions limits are not available.

TABLE 3-1A. VOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8260B/*8260C*)	Corrective Action
Applies to: USEPA Methods 8000C/8260B/8260C			
Holding times	Samples must be analyzed within holding time.	Analyze within 14 days from collection for preserved aqueous samples and solids. Analyze within 7 days from collection for unpreserved aqueous.	1. If holding times are exceeded for initial or any re-analyses required due to QC excursions. 2. Notify QAO since re-sampling may be required. 3. Document any observations and corrective action in the case narrative corrective action in the case narrative.
Solid sample collection	Samples must be prepared using USEPA Method 5035. The collection and preparation methods for each sample will be identified in the case narrative.	NA	NA
MS Tuning	Once every 12 hours prior to initial calibration and calibration verifications. Analytical sequence must be completed within 12 hours of the GC/MS Instrument Performance Check	1. Bromofluorobenzene (BFB) key ions and abundance criteria listed in the method must be met for all 9 ions and analyses must be performed within 12 hours of injection of the BFB. 2. Part of the BFB peak will not be background subtracted to meet tune criteria. 3. Documentation of all bromofluorobenzene analyses and evaluation must be included in the data packages.	1. Tune the mass spectrometer. 2. Document any observations and corrective action in the case narrative. 3. Samples cannot be analyzed until control limit criteria have been met.

TABLE 3-1A. VOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8260B/*8260C*)	Corrective Action
Initial Calibration	Prior to sample analysis and when calibration verifications criteria are not met. Initial calibration will contain all target analytes in each standard. Quantitation of analyses will utilize the initial calibration results. Sequence must be completed within 12 hours of the GC/MS Instrument Performance Check	1. Five concentrations bracketing expected concentration range for all compounds of interest. One standard must be at or less than the QL. 2. One second-source standard must be analyzed immediately following the initial calibration at the mid-calibration concentration. This standard must be within 30% recovery or within laboratory control limits. 3. It is also recommended that a separate standard at the MDL level be analyzed after calibration is complete to check sensitivity. 4. Response factor (RF) as listed in Method 8260B, with remaining RFs factor $\geq$ 0.050 except for ketones with response factor $\geq$ 0.010 *5. 8260C- RFs must meet criteria in Method Table 4. The remaining RFs factor $\geq$ 0.050 except for ketones with response factor $\geq$ 0.010* 6. For compound with %RSD >15, quantitation must be performed using a separate calibration curve and the Coefficient of Determination (COD) must be $\geq$ 0.990. *7. 8260C - For compound with %RSD >20, quantitation must be performed using a separate calibration curve and the COD must be $\geq$ 0.990.* *8. If linear regression is used for the calibration curve, the low calibration standard should be evaluated for accuracy using %D of 30% from true value.* *9. Relative retention for each target analyte in each calibration standard must agree within $\pm$ 0.06 units.*	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document any observations and corrective action in the case narrative. 4. Samples should not be analyzed until calibration control limit criteria are met. .

TABLE 3-1A. VOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8260B/*8260C*)	Corrective Action
Calibration Verification	Every 12 hours, following BFB. The calibration verification will contain all target analytes in each standard at a concentration that is representative of the midpoint of the initial calibration.	1. Within percent drift or percent difference (%D) of ≤ 20 for target analytes. RF requirements are the same as listed in the initial calibration. 2. The internal standards areas and retention times must meet the method criteria.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document any observations and corrective action in the case narrative; samples should not be analyzed until calibration control limit criteria are met.
Preparation Blank Analysis	Every 12 hours, following calibration verification	1. Methylene chloride less than 3 times QL, 2-butanone and acetone less than 5 times QL. Remaining analytes less than QL. 2. QLs and MDLs will be provided along with the preparation blank results.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument, recalibrate analytical system, and reanalyze all samples if detected for same compounds as in blank. 3. Document any observations and corrective action in the case narrative - samples cannot be analyzed until blank criteria have been met.
Field/Equipment Blank Analysis	Field collected - One per sampling event, or one per 20 samples or one per matrix (for less than 20 samples)	Methylene chloride less than 3 times QL, 2-butanone and acetone less than 5 times QL. Remaining analytes less than QL. QLs and MDLs will be provided along with the preparation blank results.	1. Investigate problem. 2. Document any observations and in the case narrative.
Trip Blank	Field provided – One for each cooler containing VOC samples.	Methylene chloride less than 3 times QL, 2-butanone and acetone less than 5 times QL. Remaining analytes less than QL. QLs and MDLs will be provided along with the preparation blank results.	1. Investigate problem. 2. Document any observations and in the case narrative.
Laboratory Control Sample Analysis	Each analytical batch (every 12 hours). Prepared independently from calibration standards. Spike must contain all target analytes and should be at a concentration, which is in the lower 1/2 of the calibration curve.	Recovery within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. If recovery failures are above control limits and these target analytes are not detected in the associated samples, corrective action is not required. 2. If recovery failures are below control limits, reanalyze LCS. 3. If re-analysis fails, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document any observations and corrective action in the case narrative.

TABLE 3-1A. VOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8260B/*8260C*)	Corrective Action
Internal Standards	All samples and blanks (including MS/MSD)	1. Response -50% - +200% of internal standards from continuing calibration of the day. 2. RT must be ± 30 sec. from associated calibration verification standard of that sequence.	1. Reanalyze. 2. If still outside of the limits, report both analyses. 3. Document any observations and corrective action in the case narrative.
Surrogate Spike	All samples and blanks (including MS/MSD)	Recovery within laboratory control limits. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze any environmental or QC sample with surrogates that exceed control limits. 2. If still outside of the limits, report both analyses. 3. Document any observations and corrective action in the case narrative
Matrix Spike/ Matrix Spike Duplicate (MS/MSD) Analysis	Collected one per 20 samples or one per matrix (for less than 20 samples) Samples from the investigation must be used for MS/MSD analysis. Spike must contain complete list of target analytes.	Recovery and RPD within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if <10%. 2. If reanalysis is still <10%, report both analyses and document in the case narrative. 3. If >10%, document in case narrative; no additional corrective action required. 4. Document corrective action in the case narrative
Field Duplicate Analysis	Field collected - One for each 20 samples or one per matrix (for less than 20 samples) Field duplicate will not be identified to the laboratory.	Validation criteria: 50% RPD for waters, 100% RPD for solids. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.

TABLE 3-1A. VOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8260B/*8260C*)	Corrective Action
Target Analyte Identification	As required for identification of target analytes	1. The intensities of the characteristic ions of a compound maximize in the same scan or within one scan of each other. Selection of a peak by a data system target compound search routine where the search is based on the presence of a target chromatographic peak containing ions specific for the target compound at a compound-specific retention time will be accepted as meeting this criterion. 2. The relative retention time (RRT) of the sample component is within ± 0.06 RRT units of the RRT of the standard component. 3. The relative intensities of the characteristic ions agree within 30% of the relative intensities of these ions in the reference spectrum. (Example: For an ion with an abundance of 50% in the reference spectrum, the corresponding abundance in a sample spectrum can range between 20% and 80%.) 4. Structural isomers that produce very similar mass spectra should be identified as individual isomers if they have sufficiently different GC retention times 5. Identification is hampered when sample components are not resolved chromatographically and produce mass spectra containing ions contributed by more than one analyte. When gas chromatographic peaks obviously represent more than one sample component (i.e., a broadened peak with shoulder(s) or a valley between two or more maxima), appropriate selection of analyte spectra and background spectra is important.	Not applicable

TABLE 3-1A. VOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8260B/*8260C*)	Corrective Action
Target Analyte Identification	As required for identification of target analytes	Examination of extracted ion current profiles of appropriate ions can aid in the selection of spectra, and in qualitative identification of compounds. When analytes co-elute (i.e., only one chromatographic peak is apparent), the identification criteria may be met, but each analyte spectrum will contain extraneous ions contributed by the co-eluting compound.	Not applicable
Target Analyte Quantitation	Apply USEPA Method 8000C for medium level extraction technique	Moisture correction in accordance with USEPA Method 8000C will be applied to the complete set of solid samples, regardless of the percent moisture content..	Not applicable
Tentatively Identified Compound	If required, perform for each sample and blank analysis. Non-target compounds will be reported using a Mass Spectral Library search.	Not applicable	Not applicable
Dilutions	1. When target analyte concentration exceeds upper limit of calibration curve. 2. When matrix interference is demonstrated by the lab and documented in the case narrative (highly viscous samples or a large number of nontarget peaks on the chromatogram). 3. It is recommended that a reagent blank be analyzed if an analyte saturates the detector or if highly concentrated analytes are detected. Otherwise data impacted from carryover cannot be used. 4. Laboratory will note in the data deliverables which analytical runs were reported.	1. The reagent blank will meet the method blank criteria.	1. Reanalyze reagent blank until method blank criteria are met. 2. Document corrective action in the case narrative.
Percent solids	For soil samples, the percent solids will be determined and sample results will be corrected for percent solids.	Not applicable	Not applicable
pH Determination	Once sample aliquot is taken from the VOC vial, the pH of water samples must be determined.	Record pH and report in the case narrative.	Not applicable
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable

TABLE 3-1A. VOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8260B/*8260C*)	Corrective Action
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable
Deliverables	1. Full deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures and any observations of bubbles in sample containers will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.
Method and QAPP requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods that are currently used by the laboratory. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with the QAO will be documented and included in the data packages.
Source: O'Brien & Gere

TABLE 3-1B. VOCS SOIL VAPOR QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Applies to USEPA Method TO-15			
Holding Times	Samples must be analyzed within holding time. Used and un-used canisters must be returned to the laboratory within 15 days of shipment of the canisters to the sampling location.	Analyze within 30 days of sample collection. Preservation of sample containers is not required.	If holding times are exceeded for initial or re-analyses required, notify QAO since re-sampling may be required. Document communications, any observations and corrective action in the case narrative
SUMMA® Canister Preparation	1. Canisters are equipped with a laboratory preset regulator, pressure gauge, critical orifice, stainless steel frit dust filter over the orifice, and specially prepared interior surfaces. 2. The flow controller (regulator) is preset at the laboratory for sample collection periods and the collection period is identified for each canister. 3. Canisters are shipped to the site at sub-atmospheric pressure approximating negative 30 inches of mercury. 4. The laboratory evacuates the canister to approximately – 30 inches of Hg prior to shipping.		
Sample collection using SUMMA® canisters	1. Samples will be collected for sample duration of 8 hours. 2. The backpressure is primarily a factor of the length of the tubing from the sampling point to the canister, the interior diameter of the tubing, the construction of the sampling probe, and the soil type. 3. If the backpressure constraint is greater than the vacuum in the canister, sample collection will not occur. 4. When possible, the system backpressure should be evaluated prior to sampling. 5. The method by which the ambient pressure and temperature will be obtained must be either weather station or portable instrument for exterior samples.		
SUMMA® Canister Leak Test Evaluation Prior to Collection	All canisters are leak tested prior to each sampling. Canister pressure must be recorded by lab prior to shipment to the client (approximately -30 inches of mercury), and by field after sample collection. The pressure must be recorded by lab upon receipt.	The difference between the initial canister pressure recorded at the laboratory and the subsequent pressure reading prior to sample collection at the field location must not be greater than 10 in Hg.	1. If canister pressure is exceeded notify QAO since re-sampling may be required. 2. Document communications, any observations and corrective action in the case narrative.
SUMMA® Canister Leak Test Evaluation After Collection	Canister pressure should be recorded by the field after sample collection, and by the lab upon receipt at the lab.	The difference between the pressure recorded in the field after sample collection and the pressure recorded by the lab upon sample receipt must not be greater than 10 in Hg. If pressure difference is exceeded, documentation instructing the lab to analyze the sample must be provided.	1. If canister pressure is exceeded notify QAO since re-sampling may be required. 2. Document communications, any observations and corrective action in the case narrative.
SUMMA® Canister Filling	The canisters must be filled to a minimum of -15 in Hg, but should be filled to between -5 in Hg and -2 in Hg when collection of sample is completed.	Canisters used for sample collection should be filled properly.	1. If canister filling requirement is exceeded notify QAO since re-sampling may be required. 2. Document communications, any observations and corrective action in the case narrative.
SUMMA® Canister Cleaning	Canisters must be clean and free of any contaminants before sample collection. Canisters will be batch certified. It is recommended that canisters are individually certified for low level samples (<0.5 ug/m3). The same laboratory that certifies the canisters as clean must analyze the sample canisters. Certification should be provided in the data package. The laboratory must document which canisters are associated with each batch certification.	Canisters are cleaned using either humid zero nitrogen cleaning procedures as described in USEPA Method TO-15 or the canisters are heated in an isothermal oven or by use of heating bands. Batch certified: 1 of the canisters per batch of 12 (8.3%)are analyzed by TO-15. Clean canisters do not contain analytes above or equal to the quantitation limit (QL). Any canister that has not tested clean will not be used.	1. If canister cleaning requirement is exceeded notify QAO since re-sampling may be required. 2. Document communications, any observations and corrective action in the case narrative.

TABLE 3-1B. VOCS SOIL VAPOR QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
GC/MS tuning	Once every 24 hours prior to initial calibration and calibration verification.	1. Tune key ions and abundance criteria listed in USEPA Method TO-15 must be met for all ions and analyses must be performed within 24 hours of injection of the tune. 2. Part of the tune peak will not be background subtracted to meet tune criteria. 3. Documentation of all tune analyses and evaluations must be included in the data packages.	1. Tune the mass spectrometer. 2. Document communications, any observations and corrective action in the case narrative - samples must not be analyzed until control limit criteria have been met.
Analytical Sequence	Analytical sequence is defined as analyses performed within a 24-hour period.	Not applicable	Not applicable
Initial Calibration (IC)	Prior to sample analysis and when calibration verification criteria are not met. Initial calibration will contain all target analytes in each standard.	1. Minimally five concentrations of standards bracketing the expected concentration range for all compounds of interest. One standard must be at or below the QL. 2. The %RSD must be less than or equal to 30 for all target analytes or calibration coefficient of greater than 0.990 for calibration curves 3. Minimum relative response factor (RRF) of ≥ 0.05. 4. If used, tracer gas must be included in calibration. 5. Quantitation of analyses will utilize the initial calibration results.	1. Identify and correct problem. 2. Recalibrate instrument. Samples must not be analyzed until initial calibration criteria are met.
Calibration Verification (CCV)	Every 24 hours, following tune. Calibration verification will contain all target analytes in each standard at a concentration that is representative of the midpoint of the initial calibration.	1. The percent difference must be less than or equal to 30 for all target analytes 2. Minimum RRF of ≥ 0.05.	1. Reanalyze. 2. f criteria are still not met, identify and correct problem and recalibrate. Samples must not be analyzed until continuing calibration criteria are met.
Method Blank Analysis	Prepared with each analytical sequence of 24-hour period. The method blank is an unused, certified canister that has not left the laboratory. The blank canister is pressurized with humidified, ultra-pure zero air and carried through the same analytical procedure as a field sample. The injected aliquot of the blank must contain the same amount of internal standards that are added to each sample.	1. The laboratory method blank must be analyzed after the calibration standard and before any samples are analyzed. 2. The blank can not contain any target analyte at a concentration greater than the QL or analytes with elution characteristics and mass spectral features that would interfere with identification and measurement of a method analyte.	1. Reanalyze blank. 2. If limits are still exceeded, investigate and correct problem. Otherwise, flag data indicating blank contamination was detected. 3. Document communications, any observations and corrective action in the case narrative.
Field/ Equipment Blank Analysis (when requested)	Laboratory-supplied clean SUMMA canister for each batch of canisters. Collected one per sampling day and/or one after every 20 samples, if required. Canister blank may not be required for a project.	The blank can not contain any target analyte at a concentration greater than the QL or analytes with elution characteristics and mass spectral features that would interfere with identification and measurement of a method analyte.	1. Investigate problem. 2. Document communications, any observations and corrective action in the case narrative.

TABLE 3-1B. VOCS SOIL VAPOR QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Internal Standards	Samples, blanks, LCSs must be spiked with method specified internal standards. Add sufficient internal standard equivalent to 10 ppbv in the sample.	1. The area response for each internal standard must be within ±40 percent of the mean area response of the internal standard in the most recent valid calibration verification. 2. The retention time for each of the internal standards in the blanks must be within ±0.33 minutes between the analysis and the most recent valid calibration verification.	1. Reanalyze. 2. If recovery is still outside criteria, report both analyses. 3. Document communications, any observations and corrective action in the case narrative.
Laboratory Control Sample (LCS) /Laboratory Control Sample Duplicate (LCSD)	Every 20 samples, one per analysis sequence. LCS will contain all target analytes in each calibration standard, using a second source, at a concentration that is near a midpoint calibration standard. LCSD should also be analyzed for precision if laboratory duplicate analyses are not performed.	Recovery within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	If recovery failures are above control limits and these compounds are not detected in the associated samples above the MDL or QL, corrective action is not required. If recovery failures are below control limits, reanalyze LCS. If reanalysis fails, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. Document communications, any observations and corrective action in the case narrative
Field Duplicate Analysis	One per 20 samples.	Within 25 relative percent difference (RPD) for soil vapor samples. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable
Sample Analysis	All SUMMA Canister samples should be at temperature equilibrium in the laboratory.	Not applicable	Not applicable
Sample Dilution	Automatic dilution of samples is permitted to obtain an aliquot of sample from the canister. Samples must be diluted and re-analyzed when concentrations exceed the highest calibration standard.	Makeup air should only be humidified ultra pure air. Air source must be same as that used for method blank preparation. Dilution will keep the concentration in the upper half of the initial calibration range.	Not applicable
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable

TABLE 3-1B. VOCS SOIL VAPOR QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Deliverables	Full data deliverables must be provided to document each audit item for easy reference and inspection. An example calculation will be provided for each type of analysis, for each type of matrix in the data package using samples from the project. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. Final spiking concentrations will be presented in summary form. Run logs will be provided in the data packages. Canister pressures prior to shipment and upon receipt, canister certification documentation and leak check evaluation documentation must be included in the data package.	Not applicable	Provide missing or additional deliverables for validation purposes.
Method requirements	The laboratory will perform the method as presented in this table and will adhere to the requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the table in the data package case narrative.	Not applicable	Not applicable

Notes:
Data validation will be performed in accordance with QA/QC criteria established in this table and the analytical methods that are currently used by the laboratory. Excursions from QAPP criteria will be qualified based on guidance provided in this table.
Communications with O'Brien & Gere will be documented and referenced in the data packages.
Source: O'Brien & Gere

TABLE 3-1C. VOCS USING USEPA METHOD 624 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	**Control Limits**	**Corrective Action**
Holding times	Samples must be analyzed within holding time.	Analyze within 14 days from collection; samples preserved to pH less than or equal to 2. If residual chlorine is present in samples, add sodium thiosulfate to the sample container before shipping to the site.	1. If holding times are exceeded for initial or any re-analyses required due to quality control excursions. 2. Notify Quality Assurance Officer (QAO) since re-sampling may be required. 3. Document corrective action in the case narrative.
GC/MS Instrument Performance Check	Once every 12 or 24 hours prior to initial calibration and calibration verifications. Analytical sequence must be completed within 12 or 24 hours of the GC/MS Instrument Performance Check	Bromofluorobenzene (BFB) key ions and abundance criteria listed in Table 2 of Method 624 must be met for all 9 ions and analyses must be performed within 12 or 24 hours of injection of the BFB. Part of the BFB peak will not be background subtracted to meet tune criteria. Documentation of all check analyses and evaluation must be included in the data packages.	1. Tune the mass spectrometer. 2. Document corrective action in the case narrative. 3. Samples cannot be analyzed until control limit criteria have been met.
Initial Calibration	Prior to sample analysis and when calibration verification criteria are not met.	A minimum of three concentrations for each target analyte bracketing expected concentration range for all target compounds. One standard must be at the QL concentration. If RSDs are less than 35%, the average response factor is used for quantitation. If RSD greater than or equal to 35%, the laboratory must generate and use a calibration curve for quantitation. Apply a linear calibration with least squares regression. Use r for un-weighted least squares regression, Coefficient of Determination (COD) or r^2; r, COD or r^2 must be greater than 0.990. Or apply non-linear calibration using no more than third order with seven standards. COD or r^2 must be greater than 0.990. Response factors *should be* greater than or equal to 0.05 for the target analytes.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document corrective action in the case narrative. 4. Samples should not be analyzed until calibration criteria are met. 5. Document corrective action in the case narrative; samples should not be analyzed until calibration criteria are met.
Continuing Calibration Verification (CCV)	Every day of analysis, following Instrument Performance Check at a concentration of 20 ug/L or at the lower end of the calibration curve.	The recoveries for the CCV target analytes must meet criteria listed in Table 5 of Method 624. Response factors *should be* greater than or equal to 0.05 for target analytes.	1. Reanalyze CCV for the failing target analyte. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document corrective action in the case narrative; samples should not be analyzed until calibration criteria are met.
Laboratory Method Blank Analysis	Every day of analysis, following CCV.	Common laboratory contaminants (acetone, methylene chloride) less than 5 X QL.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument, recalibrate analytical system, and reanalyze all samples if detected for same compounds as in

TABLE 3-1C. VOCS USING USEPA METHOD 624 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	**Control Limits**	**Corrective Action**
		Remaining target analytes less than QL.	blank. 3. Document corrective action. 4. Samples cannot be analyzed until blank criteria have been met.
Laboratory Control Sample (LCS) Analysis	Each analytical batch (every 12 or 24 hours). Prepared independently from calibration standards. Spike must contain all target analytes and should be at a concentration, which is in the lower 1/2 of the calibration curve.	Recovery within Method Table 5 or laboratory control limits. For compounds without established control limits, 70 to 130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. If recovery failures are above control limits and these target analytes are not detected in the associated samples, corrective action is not required. 2. If recovery failures are below control limits, reanalyze LCS and examine results of other QC analyses. 3. If other QC criteria have not been met, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document corrective action in the case narrative.
Internal Standards	All samples and blanks and quality control samples.	Response -50% to +100% of internal standards from the midpoint of the CCV. RT must be within 30 sec of the mean retention time in the associated calibration verification standard.	1. Reanalyze. 2. Document corrective action.
Matrix Spike/ Matrix Spike Duplicate Analysis	Collected per project requirements. Samples from the investigation must be used for MS/MSD analysis. If samples were not designated as MS/MSD samples, contact O'Brien & Gere Project Manager upon receipt of samples at the laboratory. Spike must contain complete list of target analytes.	Recovery within Method Table 5 or laboratory control limits. For compounds without established control limits, 70 to 130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if less than 10% recovery. 2. If greater than 10% and LCS criteria are met, document in case narrative; no additional corrective action required. 3. If LCS criteria are exceeded also, examine other QC data for source of problem; i.e., surrogate recoveries for calibration data for instrument performance issues. 4. Take corrective action as required, re-extract, or reanalyze samples and associated MS/MSD and LCSs as required.
Equipment and Field Blank Analysis	Collected per project requirements. Equipment blank is not required if dedicated sampling equipment used.	Common laboratory contaminants (acetone, methylene chloride) less than 5 X QL. Remaining target analytes less than QL. QLs and MDLs will be provided along with the blank results.	1. Document in case narrative.
Trip Blank	1 per cooler containing VOC samples.	Common laboratory contaminants (acetone, methylene chloride) less than 5 X QL. Remaining target analytes less than QL. QLs and MDLs will be provided along with the blank results.	1. Document in case narrative.
Field Duplicate Analysis	Collected per project requirements.	50% RPD for aqueous samples. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.

TABLE 3-1C. VOCS USING USEPA METHOD 624 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	**Control Limits**	**Corrective Action**
		evaluate field duplicates.	
Surrogate Spike	All samples, blanks, and quality control samples.	Recovery within laboratory control limits. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze any environmental or QC sample with surrogates that exceed control limits. 2. Document corrective action.
Identification	Samples, blanks, and quality control samples	Retention times must be within 30 seconds of the CCV. The characteristic masses for the primary and two secondary ions must maximize within one scan of each other. The peak heights of the three ions present in standard mass spectrum must be within 20% of the relative intensity of the reference spectrum. The reference spectrum must not contain co-eluting analytes. For isomers, resolution (baseline to valley height between isomers) must be less than 25%.	1. If identification criteria are not met, but in the judgment of the GC/MS operator the target compound is present, proceed with quantitation and document reasoning in data package.
Quantitation	Samples, blanks, and quality control samples	Internal standard method of quantitation must be used by applying the primary characteristic ions specified in the method unless interferences are present. Alternate use of ions must be documented. Concentrations must be within the linear calibration range of the instrument.	1. If concentration is above the linear range, dilute the sample and reanalyze. The dilution should result in concentration being within the upper range of the calibration curve.
Dilutions	1. When target analyte concentration exceeds upper limit of calibration curve. 2. When matrix interference is demonstrated by the lab and documented in the case narrative (highly viscous samples or a large number of nontarget peaks on the chromatogram). 3. A reagent blank will be analyzed if an analyte saturates the detector or if highly concentrated analytes are detected. 4. Laboratory will note in the data deliverables which analytical runs were reported.	1. The reagent blank will meet the method blank criteria.	1. Reanalyze reagent blank until blank criteria are met. 2. Document corrective action in the case narrative.
pH Determination	Once sample aliquot is taken from the VOC vial, the pH of water samples must	Record pH and report in the data package.	Not applicable

TABLE 3-1C. VOCS USING USEPA METHOD 624 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	**Control Limits**	**Corrective Action**
	be determined.		
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable
Deliverables	1. When requested, full deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures and any observations of bubbles in sample containers will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.

TABLE 3-1C. VOCS USING USEPA METHOD 624 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	**Control Limits**	**Corrective Action**
	7. Run logs will be provided in the data packages.		
Method and QAPP requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with the QAO will be documented and included in the data packages.

TABLE 3-2. SVOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8270C/8270D)	Corrective Action
Applies to: USEPA Methods 8000C/8270C/8270D			
Holding Times	Samples must be extracted and analyzed within holding time.	Extract within 7 days from collection for aqueous samples; 14 days for soil samples. Analyze extracts within 40 days of extraction.	If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the QAO since re-sampling may be required.
MS Tuning	Once every 12 hours prior to initial calibration and calibration verification. Must contain 50ng/uL of 4,4-DDT, pentachlorophenol, and benzidine.	1. DFTPP key ions and abundance criteria listed in the method must be met for all 13 ions and analyses must be performed within 12 hours of injection of the DFTPP. 2. Part of the DFTPP peak will not be background subtracted to meet tune criteria. 3. Documentation of all DFTPP analyses and evaluations must be included in the data packages. 4. Degradation of 4,4-DDT <20%. Peak tailing must not be evident.	1. Tune the mass spectrometer. 2. Document any observations and corrective action in the case narrative - samples cannot be analyzed until control limit criteria have been met.

TABLE 3-2. SVOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8270C/8270D)	Corrective Action
Initial Calibration	Prior to sample analysis and when calibration verification criteria are not met. Initial calibration will contain all target analytes in each standard. Quantitation of analyses will utilize the initial calibration results.	1. Five concentrations bracketing expected concentration range for all compounds of interest with one standard at or less than the QL 2. One second-source standard should be analyzed immediately following the initial calibration at the mid-calibration concentration. This standard must be within 30% recovery or within laboratory control limits. 3. It is also recommended that a separate standard at the MDL level be analyzed after calibration is complete to check sensitivity. 4. Response factors (RFs) must be >0.050. 5. 8270D- RFs must meet criteria listed in Method 8270D; remaining RFs must be 0.05 with RF of 0.01 for n-nitroso-di-n-propylamine and 2,4-dimethylphenol. 6. For compounds with %RSD >15, quantification must be performed using a separate calibration curve and the COD must be ≥ 0.990. 7. 8270D - For compounds with %RSD >20, quantification must be performed using a separate calibration curve and the COD must be ≥ 0.990. If linear regression is used for the calibration curve, the low level initial calibration standard should be evaluated for accuracy using criteria of %D < 30% from the true value. 8. Relative retention for each target analyte in each calibration standard must agree within ± 0.06 units.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document any observations and corrective action in the case narrative - samples should not be analyzed until calibration control limit criteria are met.

TABLE 3-2. SVOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8270C/8270D)	Corrective Action
Calibration Verification	Every 12 hours, following DFTPP. Calibration verification will contain all target analytes in each standard at a concentration that is representative of the midpoint of the initial calibration.	1. Within method specified criteria, percent drift or percent difference (%D) ≤ 20 for target analytes. Response factor requirements as listed in initial calibration. 2. 8270D- %D ≤ 20 for target analytes. 3. The internal standards areas and retention times must meet the method criteria.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document any observations and corrective action in the case narrative - samples should not be analyzed until calibration control limit criteria are met.
Preparation Blank Analysis	Prepared with each extraction batch of no more than 20 analytical samples.	1. Common laboratory contaminants (phthalate) less than 5 x QL. Remaining analytes less than QL. 2. QLs and MDLS will be provided along with the preparation blank results.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument, recalibrate analytical system and re-extract and reanalyze all samples if detected for same compounds as in the blank. 3. Document any observations and corrective action in the case narrative - samples should not be analyzed until blank criteria have been met.
Field/ Equipment Blank Analysis	Collected one per sampling event, or one per 20 samples or one per matrix (for less than 20 samples)	1. Common laboratory contaminants (phthalate) less than 5 x QL. Remaining analytes less than QL. 2. QLs and MDLS will be provided along with the blank results.	1. Investigate problem. 2. Document any observations and corrective actions in the case narrative.
Laboratory Control Sample Analysis	Prepared with each extraction batch, of no more than 20 analytical samples. Prepared independently from calibration standards. Spike must contain all target compounds and should be at a concentration that is approximately in the lower 1/2 of the calibration curve.	Recovery within laboratory control limits. For compounds without established laboratory control limits, 70 to 130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. If recovery failures are above control limits and these compounds are not detected in the associated samples, no corrective action is required. 2. If recovery failures are below the control limits, reanalyze LCS. 3. If re-analysis fails, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document any observations and corrective action in the case narrative.

TABLE 3-2. SVOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8270C/8270D)	Corrective Action
Internal Standards	All samples and blanks (including MS/MSD).	Response -50% - +200% of the internal standards from the continuing cal of the day. RT must be ± 30 sec. from calibration verification of that sequence.	1. Reanalyze. 2. If recovery is still outside criteria, report both analyses. 3. Document any observations and corrective action in the case narrative.
Surrogate Spike	All samples and blanks (including MS/MSD).	Recovery within laboratory control limits. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if more than 1 AE or 1 BN fails, or if any one surrogate recovery is < 10%. 2. If recovery meets criteria, report both analyses. 3. If re-analysis recovery fails and if the recovery is <10%, re-extract sample if within holding time and re-analyze. 4. If re-analysis recovery fails and if the recovery is >10%, report both analyses. 5. Document any observations and corrective action in the case narrative.
Matrix Spike/ Matrix Spike Dup. (MS/MSD) Analysis	Collected one per 20 samples or one per matrix (for less than 20 samples) Samples from the investigation must be used for MS/MSD analysis. Spike must contain complete list of target analytes.	Recovery and RPD within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if <10%. 2. If reanalysis is < 10%, report both analyses and document in the case narrative. 3. If reanalysis is >10%, document in the case narrative. 4. Document any observations and corrective action in the case narrative.
Field Duplicate Analysis	Field collected - One for every 20 samples or one per matrix (for less than 20 samples) Field duplicate will not be identified to the laboratory.	Validation criteria: 50% RPD for waters, 100% RPD for solids. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.

TABLE 3-2. SVOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8270C/8270D)	Corrective Action
Target Analyte Identification	As required for identification of target analytes	1. The intensities of the characteristic ions of a compound maximize in the same scan or within one scan of each other. Selection of a peak by a data system target compound search routine where the search is based on the presence of a target chromatographic peak containing ions specific for the target compound at a compound-specific retention time will be accepted as meeting this criterion. 2. The relative retention time (RRT) of the sample component is within ± 0.06 RRT units of the RRT of the standard component. 3. The relative intensities of the characteristic ions agree within 30% of the relative intensities of these ions in the reference spectrum. (Example: For an ion with an abundance of 50% in the reference spectrum, the corresponding abundance in a sample spectrum can range between 20% and 80%.) 4. Structural isomers that produce very similar mass spectra should be identified as individual isomers if they have sufficiently different GC retention times.	Not applicable

TABLE 3-2. SVOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8270C/8270D)	Corrective Action
		5. Identification is hampered when sample components are not resolved chromatographically and produce mass spectra containing ions contributed by more than one analyte. When gas chromatographic peaks obviously represent more than one sample component (i.e., a broadened peak with shoulder(s) or a valley between two or more maxima), appropriate selection of analyte spectra and background spectra is important. 6. Examination of extracted ion current profiles of appropriate ions can aid in the selection of spectra, and in qualitative identification of compounds. When analytes coelute (i.e., only one chromatographic peak is apparent), the identification criteria may be met, but each analyte spectrum will contain extraneous ions contributed by the co-eluting compound.	
Cleanup	Gel permeation chromatography (GPC) should be performed for water should extracts with high molecular weight contaminants.	Calibrate according to method. Criteria must be met as listed in method for calibration and blank analysis.	Clean GPC column or replace.
Tentatively Identified Compounds	If required, prepare for each sample and blank analysis. Non-target compounds will be reported using a Mass Spectral Library search.	Not applicable	Not applicable
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable
Percent solids	For soil/ samples, the percent solids will be determined and sample results will be corrected for percent solids.	Not applicable	Not applicable

TABLE 3-2. SVOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8270C/8270D)	Corrective Action
Dilutions	1. When target analyte concentration exceed upper limit of calibration curve. 2. When matrix interference demonstrated by lab and documented in the case narrative (highly viscous samples or a large number of non-target peaks on the chromatogram). 3. Samples should be cleaned up during sample preparation/extraction procedure using appropriate methods when matrix interference is present. 4. Laboratory will note in the data deliverables which analytical runs were reported.	Not applicable	Not applicable
Laboratory control limits	1. Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable
Deliverables	1. Full deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.

TABLE 3-2. SVOCS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8270C/8270D)	Corrective Action
Method and QCD requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods that are currently used by the laboratory. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with the QAO will be documented and included in the data packages.
Source: O'Brien & Gere

TABLE 3-3. PCBS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns) (*Criteria for 8000C/8082/8082A*)	Corrective Action (Applies to both primary and confirmation columns)
Applies to: USEPA Method 8000C/8082/8082A			
Holding Times	Samples must be extracted and analyzed within holding time.	Extract within 7 days from collection for aqueous samples and 14 days from collection for solid samples. Analyze extracts within 40 days of extraction.	1. If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the QAO immediately since re-sampling may be required. 2. Document any observations and corrective action in the case narrative.
Initial Calibration	Prior to start up and when criteria are exceeded for continuing calibration. Calibrations must contain all target analytes. Quantitation of analyses will utilize the initial calibration results.	1. Minimally five concentrations for Aroclor 1016/1260 (one point calibration for the remaining Aroclors), one calibration standard must be at concentration less than or equal to the QL. 2. Recommended that if results are reported below the QL, a separate standard at the MDL level analyzed after calibration is complete to check sensitivity. 3. If RSD ≤20%, the average relative response factor (internal calibration) or average calibration factor (external calibration) is used for quantitation. If RSD >20%, a linear regression calibration that does not pass through the origin with a correlation coefficient (r) ≥0.990 is used for quantitation; or a nonlinear first or second order calibration curve with a coefficient of determination (COD) of ≥0.990 is used for quantitation.	1. Identify and correct problem. 2. Recalibrate instrument; samples should not be analyzed until initial calibration criteria are met. 3. Document any observations and corrective action in the case narrative.
Calibration Verification	Calibration standards must contain Aroclor 1016/1260 at the mid-range concentration. Calibration verification standards must be analyzed every 20 samples and must bracket each end of the sample sequence. In the case that Aroclors are detected above the MDL concentration in the associated samples, the identified Aroclor must be analyzed within the same 48 hour period as the sample in a valid analytical sequence.	Calibration verification response (% difference) or concentration (% drift) ≤ 15%. 8282A - Calibration verification response %D ≤ 20%. RT for each target analyte must be within established RT windows.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate; reanalyze samples back to last compliant calibration standard. Samples must be bracketed by compliant calibration standards. 3. Document any observations and corrective action in the case narrative.
Retention Time Windows	Retention time windows (absolute retention time) must be established in accordance with USEPA Method 8000B/8000C or relative retention times must be used if internal standards are employed.	Compounds must be within established retention time windows or within laboratory established relative retention time criteria for the succeeding calibration standards. Retention time windows must be provided for each calibration verification. Retention times for each surrogate analyzed for samples and QC samples must be provided on a summary form.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate; reanalyze samples back to last compliant calibration standard. 3. Document any observations and corrective action in the case narrative.

TABLE 3-3. PCBS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns) (*Criteria for 8000C/8082/ 8082A*)	Corrective Action (Applies to both primary and confirmation columns)
Method Blank Analysis	Method Blank : 1 per 20 samples of similar matrix extracted at the same time and undergo same cleanup procedures as samples or a separate cleanup blank must be prepared and analyzed.	Compound concentrations must be <QL.	1. Reanalyze. 2. If limits are still exceeded, re-extract and reanalyze method blank and associated samples. Samples must not be analyzed until method blank criteria are met. 3. Document any observations and corrective action in the case narrative.
Blank Analysis	Instrument blank: Must be analyzed at the beginning of 12 hour sequence, following the initial calibration verification standard.	Compound concentrations must be <QL.	1. Reanalyze. 2. If limits are still exceeded, re-extract and reanalyze method blank and associated samples. Samples must not be analyzed until method blank criteria are met. 3. Document any observations and corrective action in the case narrative.
Laboratory Control Sample Or Matrix Spike Blank Analysis	1 per 20 samples of similar matrix extracted at the same times. LCS must be spiked with the Aroclor suspected to be at the site at concentrations near the low end of the calibration curve. Otherwise, Aroclor 1016/1260 or other Aroclors may be used in the LCS analysis.	Percent recoveries must be within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze and examine results of other QC analyses. 2. If the percent recovery is above laboratory control limits and the affected compound is not detected in the associated samples, corrective action is not required; document in case narrative. 3. If percent recovery is below laboratory control limits or <10%, reanalyze LCS. 4. If re-analysis fails, locate and correct problem, recalibrate instrument and re-extract and/or re-analyze samples since last satisfactory LCS. 5. Document any observations and corrective action in the case narrative.
MS/MSD Analysis	1 per 20 samples of similar matrix extracted at the same times. MS/MSDs must be spiked with the Aroclor suspected to be at the site at concentrations near the low end of the calibration curve. Otherwise, Aroclor 1016/1260 or other Aroclors may be used. Samples from the investigation must be used for MS/MSD analysis.	Recovery and RPD within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if <10%. 2. If reanalysis is still <10%, report both analyses and document in the case narrative. 3. If re-analysis is >10%, no additional corrective action required. 4. Document any observations and corrective action in the case narrative.

TABLE 3-3. PCBS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns) (*Criteria for 8000C/8082/ 8082A*)	Corrective Action (Applies to both primary and confirmation columns)
Surrogate Spike	Samples, blanks, MS/MSDs, and LCSs must be spiked with method specified surrogate compounds on each column used in the analysis.	Recovery within laboratory control limits. Corrective action is not required if one of the four surrogates (for two columns) has recovery outside of control limits if the recovery is >10% and the remaining three surrogates are within control limits. Surrogate recoveries for each surrogate on each column must be provided in a summary form. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze. 2. If reanalysis recovery fails criteria but is >10%, report both analyses and document in case narrative report. 3. If reanalysis recovery is <10%, re-extract and reanalyze the sample. Special Circumstances. If matrix interference is present (as documented in the case narrative): 1. Reanalyze sample; may be at a higher dilution. 2. Report both analyses. Document any observations and corrective action in the case narrative.
Identification	Samples, blanks, and QC data.	Retention times must be within established retention time windows or must meet relative retention time criteria. Confirmation analysis is required. Retention time windows must be provided for each calibration verification.	1. Investigate problem; reanalyze calibration standards to check for retention time shift. 2. Document any observations and corrective action in the case narrative.

TABLE 3-3. PCBS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns) (*Criteria for 8000C/8082/ 8082A*)	Corrective Action (Applies to both primary and confirmation columns)
Quantitation	Samples, blanks, and QC data.	Confirmation analysis is required. USEPA CLP Form 10 Summary (or equivalent) form, providing the percent difference and retention times for all detected analytes in samples and QC samples, will be provided. Percent difference must be less than 25%: Difference between Primary column concentration and the Confirmation column divided by the Primary column times 100. Internal or external standard method may be used. Verify concentration is within linear calibration range of standards. Aroclor concentration is determined using response factor for each of the characteristic peaks and then averaging the five concentrations. Peak areas from a minimum of three Aroclor peaks unique to the target Aroclor will be used to quantitate the Aroclor concentration. Every effort must be made to meet specified QL requirements. Lab must state the technique used for quantitation of results for the samples.	1. If concentration is above linear calibration range, dilute sample and reanalyze. Dilution should result in concentration in the upper calibration range of the instrument. 2. Document any observations and corrective action in the case narrative.
Field/ Equipment Blank Analysis	Collected one per sampling equipment and after every 20 samples.	Compounds concentrations must be <QL.	1. Investigate problem; reanalyze to verify laboratory cross contamination is not a factor. 2. Document in the case narrative.
Field Duplicate Analysis	Collected 1 per matrix type; every 20 samples of similar matrix.	Validation criteria: 50% RPD for waters and 100% RPD for solids. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis during the validation process.

TABLE 3-3. PCBS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns) (*Criteria for 8000C/8082/ 8082A*)	Corrective Action (Applies to both primary and confirmation columns)
Chromatography Presentation	For each standard, sample and QC sample analysis.	Copies of chromatograms provided in the data package must be large enough to view during validation; detail of each peak involved in the Aroclor identification, including peak shape and associated baseline. In the case that matrix interference is detected or manual integration is performed, enlarged copies of those manipulations will be included in the data package for review.	1. Provide requested information.
Cleanup	Acid wash clean-up is used for PCB extracts.	Calibrate according to method. Criteria must be met as listed in method.	Not applicable
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages. USEPA Form 8 Summary form, providing the date, time of analysis of samples and QC samples, surrogate retention times and surrogate retention time window, will be provided.	Not applicable	Not applicable
Confirmation Analysis	Dual column quantitation and qualitative confirmation will be performed. The information presented in CLP Form 10 will be provided in the data package for evaluation.	Not Applicable	Not Applicable
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable
Percent solids	For solids samples, the percent solids will be determined and sample results will be corrected for percent solids.	Not applicable	Not applicable
Dilutions	1. When target analyte concentration exceed upper limit of calibration curve. 2. When matrix interference demonstrated by lab and documented in the case narrative (highly viscous samples or a large number of non-target peaks on the chromatogram).. 3. Samples should be cleaned up during sample preparation/extraction procedure using appropriate methods when matrix interference is present. 4. Laboratory will note in the data deliverables which analytical runs were reported.	1. The reagent blank will meet the method blank criteria.	1. Reanalyze reagent blank until method blank criteria are met.

TABLE 3-3. PCBS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns) (*Criteria for 8000C/8082/ 8082A*)	Corrective Action (Applies to both primary and confirmation columns)
Deliverables	1. Full deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.
Method and QCD requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods that are currently used by the laboratory. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with the QAO will be documented and included in the data packages
Source: O'Brien & Gere

TABLE 3-4. ORGANOCHLORINE PESTICIDES QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns)	Corrective Action (Applies to both primary and confirmation columns)
Applies to: USEPA Method 8000C, USEPA Method 8081A/8081B (Organochlorine Pesticides)			
Holding Times	Samples must be extracted and analyzed within holding time.	Extract within 7 days from collection for aqueous samples and 14 days from collection for solid samples. Analyze extracts within 40 days of extraction.	1. If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the Project Manager immediately since re-sampling may be required. 2. Document any observations and corrective action in the case narrative.
Initial Calibration	Prior to start up and when criteria are exceeded for continuing calibration. Calibrations must contain all target analytes. Quantitation of analyses will utilize the initial calibration results.	1. Minimally five concentrations for each single component analyte. One calibration standard must be at concentration less than or equal to the QL. 2. It is recommended that if results are reported below the QL, a separate standard at the MDL level analyzed after calibration is complete to check sensitivity. 3. Toxaphene requires a single point calibration. If detected in samples, the samples are re-analyzed behind a five-point calibration for each detected analyte. 4. If RSD ≤20% the average relative response factor (internal calibration) or average calibration factor (external calibration) is used for quantitation. If RSD >20% a linear regression calibration that does not pass through the origin with a correlation coefficient (r) ≥0.990 is used for quantitation; or a nonlinear first or second order calibration curve with a coefficient of determination (COD) of ≥0.990 is used for quantitation. 5. 8081B- Degradation of 4,4'-DDT/ endrin to 4,4'-DDE, 4,4'-DDD/ endrin ketone, endrin breakdown must be less than 15%.	1. Identify and correct problem. 2. Recalibrate instrument; samples should not be analyzed until initial calibration criteria are met. 3. Document any observations and corrective action in the case narrative.

TABLE 3-4. ORGANOCHLORINE PESTICIDES QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns)	Corrective Action (Applies to both primary and confirmation columns)
Calibration Verification	Single component analyte calibration standards must contain each target analyte at mid-range concentration. Calibration verification standards must be analyzed at the beginning of 12 hour sequence and every 20 samples (every 10 samples is recommended), and at the close of the sequence. Pesticides- A standard containing 4,4-DDT and endrin must be analyzed at the beginning of each 12 hour sequence. Calibration verification standards must be analyzed every 20 samples and must bracket each end of the sample sequence. In the case that Aroclors are detected above the MDL concentration in the associated samples, the identified Aroclor must be analyzed within the same 48 hour period as the sample in a valid analytical sequence.	Calibration verification response (% difference) or concentration (% drift) ≤ 20%. Pesticides- Degradation for 4,4-DDT and endrin must be <15%. Method 8081B- Degradation of 4,4'-DDT/ endrin to 4,4'-DDE, 4,4'-DDD/ endrin ketone, endrin breakdown must be less than 15%.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate; reanalyze samples back to last compliant calibration standard. Samples must be bracketed by compliant calibration standards. 3. Document any observations and corrective action in the case narrative.
Retention Time Windows	Retention time windows (absolute retention time) must be established in accordance with USEPA Method 8000B/8000C or relative retention times must be used if internal standards are employed.	Compounds must be within established retention time windows or within laboratory established relative retention time criteria for the succeeding calibration standards. Retention time windows must be provided for each calibration verification. Retention times for each surrogate analyzed for samples and QC samples must be provided on a summary form.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate; reanalyze samples back to last compliant calibration standard. 3. Document any observations and corrective action in the case narrative.
Blank Analysis	Method Blank : 1 per 20 samples of similar matrix extracted at the same time and undergo same cleanup procedures as samples or a separate cleanup blank must be prepared and analyzed. Instrument blank: Must be analyzed at the beginning of 12 hour sequence, following the initial calibration verification standard.	Compound concentrations must be <QL.	1. Reanalyze. 2. If limits are still exceeded, re-extract and reanalyze method blank and associated samples. Samples must not be analyzed until method blank criteria are met. 3. Document any observations and corrective action in the case narrative.
Laboratory Control Sample Or Matrix Spike Blank Analysis	1 per 20 samples of similar matrix extracted at the same times. LCSs must be spiked with each of the single component analyte at concentrations near the low end of the calibration curve.	Percent recoveries must be within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. If the percent recovery is above laboratory control limits and the affected compound is not detected in the associated samples, corrective action is not required; document in case narrative. 2. If percent recovery is below laboratory control limits or <10%, reanalyze LCS. 3. If re-analysis fails, locate and correct problem, recalibrate instrument and re-extract and/or re-analyze samples since last satisfactory LCS. 4. Document any observations and corrective action in the case narrative.

TABLE 3-4. ORGANOCHLORINE PESTICIDES QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns)	Corrective Action (Applies to both primary and confirmation columns)
MS/MSD Analysis	1 per 20 samples of similar matrix extracted at the same times. MS/MSDs must be spiked with each of the single component analyte at concentrations near the low end of the calibration curve. Samples from the investigation must be used for MS/MSD analysis. If samples were not designated as MS/MSD samples, contact QAO upon receipt of samples at the laboratory.	Recovery and RPD within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if <10%. 2. If reanalysis is still <10%, report both analyses and document in the case narrative. 3. If re-analysis is >10% no additional corrective action required. 4. Document any observations and corrective action in the case narrative.
Surrogate Spike	Samples, blanks, MS/MSDs, and LCSs must be spiked with method specified surrogate compounds on each column used in the analysis.	Recovery within laboratory control limits. Corrective action is not required if one of the four surrogates (for two columns) has recovery outside of control limits if the recovery is >10% and the remaining three surrogates are within control limits. Surrogate recoveries for each surrogate on each column must be provided in a summary form. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze. 2. If reanalysis recovery fails criteria but is >10%, report both analyses and document in case narrative report. 3. If reanalysis recovery is <10%, re-extract and reanalyze the sample. Special Circumstances. If matrix interference is present (as documented in the case narrative): 1. Reanalyze sample; may be at a higher dilution. 2. Report both analyses. Document any observations and corrective action in the case narrative.
Internal Standards	Where applicable: All samples and blanks (including MS/MSD)	Response -50% - +50% of internal standards from continuing calibration of the day. RT must be ± 30 sec. from associated calibration verification standard of that sequence.	1. Reanalyze. 2. If still outside of the limits, report both analyses. 3. Document any observations and corrective action in the case narrative.

TABLE 3-4. ORGANOCHLORINE PESTICIDES QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns)	Corrective Action (Applies to both primary and confirmation columns)
Identification	Samples, blanks, and QC data.	Retention times must be within established retention time windows or must meet relative retention time criteria. Duel column confirmation (quantitative and qualitative) analysis is required. Retention time windows must be provided for each calibration verification. USEPA CLP Form 10 Summary form, providing the percent difference and retention times for all detected analytes in samples and QC samples, will be provided. Percent difference must be less than 25 %D. %D calculation: Difference between Higher concentration of sample and Lower concentration of sample divided by the Lower concentration of sample times 100.	1. Investigate problem; reanalyze calibration standards to check for retention time shift. 2. Document any observations and corrective action in the case narrative.
Quantitation	Samples, blanks, and QC data.	Confirmation analysis is required. Internal or external standard method may be used. Verify concentration is within linear calibration range of standards. Every effort must be made to meet specified QL requirements. Lab must state the technique used for quantitation of results for the samples.	1. If concentration is above linear calibration range, dilute sample and reanalyze. Dilution should result in concentration in the upper calibration range of the instrument. 2. Document any observations and corrective action in the case narrative.
Field Blank Analysis	Field collected - One per sampling equipment and after every 20 samples.	Compounds concentrations must be <QL.	1. Investigate problem; reanalyze to verify laboratory cross contamination is not a factor. 2. Document any observations and in the case narrative.
Field Duplicate Analysis	Field collected – One for each matrix type, every 20 samples of similar matrix.	Validation criteria: 50% RPD for waters and 100% RPD for solids. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis during the validation process.

TABLE 3-4. ORGANOCHLORINE PESTICIDES QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns)	Corrective Action (Applies to both primary and confirmation columns)
Chromatography Presentation	For each standard, sample and QC sample analysis.	Copies of chromatograms provided in the data package must be large enough to view during validation; detail of each peak involved in the Aroclor identification, including peak shape and associated baseline. In the case that matrix interference is detected or manual integration is performed, enlarged copies of those manipulations will be included in the data package for review.	1. Provide requested information.
Cleanup	GPC must be performed for all pesticide solids or water extracts with high molecular weight contaminants. Sulfur must be performed for all sample extracts contaminated with sulfur. Florisil cartridge cleanups are mandatory for all pesticide extracts.	Calibrate according to method. Criteria must be met as listed in method.	For GPC, perform column maintenance, recalibrate. For florisil, obtain a new lot of cartridges.
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages. USEPA Form 8 Summary form, providing the date, time of analysis of samples and QC samples, surrogate retention times and surrogate retention time window, will be provided.	Not applicable	Not applicable
Confirmation Analysis	Dual column quantitation and qualitative confirmation will be performed. The information presented in CLP Form 10 will be provided in the data package for evaluation.	Not Applicable	Not Applicable
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable
Percent solids	For solids samples, the percent solids will be determined and sample results will be corrected for percent solids.	Not applicable	Not applicable

TABLE 3-4. ORGANOCHLORINE PESTICIDES QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency (Applies to both primary and confirmation columns)	Control Limits (Applies to both primary and confirmation columns)	Corrective Action (Applies to both primary and confirmation columns)
Dilutions	1. When target analyte concentration exceed upper limit of calibration curve. 2. When matrix interference demonstrated by lab and documented in the case narrative (highly viscous samples or a large number of non-target peaks on the chromatogram). 3. Samples should be cleaned up during sample preparation/extraction procedure using appropriate methods when matrix interference is present. 4. Laboratory will note in the data deliverables which analytical runs were reported.	1. The reagent blank will meet the method blank criteria.	1. Reanalyze reagent blank until method blank criteria are met.
Deliverables	1. Full deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.
Method and QAPP requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods that are currently used by the laboratory. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with the QAO will be documented and included in the data packages.

Source: O'Brien & Gere

TABLE 3-5. METALS, MERCURY AND TOTAL CYANIDE QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits *(Criteria for 6010C ,6020 ,6020A, 7471B, and 9012B)*	Corrective Action
Applies to: metals by USEPA Methods 6010B/6010C/6020/6020A, mercury by USEPA Methods 7470A/7471A/7471B and total cyanide by USEPA Methods 9012A/9012B/9014			
Holding Times	Samples must be digested and analyzed within holding time.	Metals: 180 days from collection to analysis. Mercury: 28 days from collection to analysis. Cyanide: 14 days from collection to analysis.	1. If holding times are exceeded for initial or any reanalysis required due to QC excursions, notify the QAO since re-sampling may be required. 2. Document any observation or corrective action in the case narrative.
Mass Tuning	*A solution containing elements representing mass regions of interest (Li, Co, In, and Tl for example) must be analyzed prior to sample analysis.*	*Mass calibrations must be within 0.1amu from the true value.* *The resolution must be <0.9amu full width at 10 percent peak height.*	*1. Adjust the mass calibration until criteria are met.*
Initial Calibration Verification and Continuous Calibration Verification (Metals, mercury, cyanide) (ICV, CCV)	A minimum of two-point calibration for ICP consisting of one at least one standard and one blank. Is required. *An appropriate internal standard is required for each analyte. Recommended internal standards are 6Li, 45Sc, 74Ge, 89Y, 103Rh, 115In, 159Tb, 169Ho, and 209Bi.* Five point calibration for remaining methods, with one standard at the QL level. Calibrate each time instrument is set up. After calibration, Initial calibration verification (ICV) is performed. The ICV is from a source independent of the calibration standards. For cyanide, the ICV must be distilled. A continuing calibration verification (CCV) is analyzed at the beginning of the run, at 10% or every 2 hours. Also verify at the end of each run. *It is also recommended that low level initial calibration standard (LLICV) and a low level calibration verification (LLCCV) standard be analyzed at the beginning and end of the run.*	ICV, CCV - 90% to 110% of expected value for ICP, AA, colorimeter, and spectrophotometer. ICV for Mercury – 90% to 110% of expected true value. CCV for Mercury - 80% to 120% of expected true value. Correlation coefficient for first or second order curve must be ≥ 0.995. For cyanide the ICV and CCV must meet 85 to 115% recovery. *Percent recoveries for LLICV/LLCCV must be within 70-130%.*	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document any observation or corrective action in the case narrative - samples should not be analyzed until calibration control limit criteria have been met.

TABLE 3-5. METALS, MERCURY AND TOTAL CYANIDE QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits *(Criteria for 6010C ,6020 ,6020A, 7471B, and 9012B)*	Corrective Action
Lower Limit of Quantitation Check (LLQC)	1. For ICP, AA, and cyanide, LLQC is a standard at the QL concentration analyzed at the beginning of each run for all elements at the QL level	The percent recovery of the LLQC must meet the control limits of 70-130%.	1. The LLQC shall be re-analyzed immediately for those analytes; if the results of the re-analysis for those analytes fall within the control limits, no further corrective action is required. 2. If the results of the re-analysis for those analytes do not fall within the control limits, the analysis shall be terminated, the problem corrected, the instrument recalibrated, the LLQC analyzed, and the samples associated with the LLQC re-analyzed. 3. Document any observation or corrective action in the case narrative.
Initial and Continuing Calibration Blank (ICB/CCB) (Metals, mercury, cyanide)	After ICV, CCV, at beginning and end of run and at a rate of 10% or every 2 hours during run.	The absolute value of the ICB and CCB must not exceed the QL.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate and reanalyze affected samples. 3. Document any observation or corrective action in the case narrative- samples cannot be analyzed until blank control limit criteria have been met.
Rinse Blank	*Rinse blank must be analyzed following every sample and standard to flush the instrument..*	*The absolute value of the rinse blank must not exceed the QL.*	1. Identify and correct problem. 2. If criteria are still not met, recalibrate and reanalyze affected samples. 3. Document any observation or corrective action in the case narrative - samples cannot be analyzed until blank control limit criteria have been met.
Preparation Blank Analysis	One for each batch of samples prepared/ digested, or 1 in 20 samples, whichever is greater. PB shall be carried through the complete procedure and contain the same acid concentration in the final solution as the sample solution used for analysis.	The absolute value of the method blank must not exceed the QL.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument and recalibrate analytical system and re-preparation and reanalyze affected samples if detected. 3. Document any observation or corrective action in the case narrative - samples cannot be analyzed until blank criteria are met.
Field/Equipment Blank Analysis	Field collected - One per sampling event, or one per 20 samples or one per matrix (for less than 20 samples)	Less than QL	1. Investigate problem. 2. Document any observation or in the case narrative.

TABLE 3-5. METALS, MERCURY AND TOTAL CYANIDE QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits *(Criteria for 6010C ,6020 ,6020A, 7471B, and 9012B)*	Corrective Action
Laboratory Control Sample Analysis	Every 20 samples or each digestion batch. Prepared independently from calibration standards.	Recovery within 80 to 120%	1. Reanalyze LCS and examine results of other QC analyses. 2. If recovery is still outside limits, report both runs. 3. Document corrective action in the case narrative.
Serial Dilution Analysis for ICP (Metals)	Required once per analytical batch when analyte concentration is >10 times the instrument detection limit (IDL) (or MDL if applicable). Samples from the investigation must be used for Serial dilution analysis.	An analysis of a 1:5 dilution of the sample should provide a result with 90% to 110% of the original determination (for concentrations 10x the lower limit of quantitation after dilution	1. Report results. 2. Document corrective action in the case narrative.
Interference Check Sample Analysis for ICP (Metals)	Beginning and end of each analytical run or twice during every 8 hours, whichever is more frequent for ICP. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents.	Results for the ICS Solution AB (ICSAB) during the analytical runs shall fall within the control limit of ±2 times the QL of the true value or ±20% of the true value, whichever is greater, for the analytes included in the ICSAB	1. Reanalyze. 2. If limits are still exceeded, adjust instrument. 3. Restart analytical run and reanalyze samples analyzed since last satisfactory ICS. 4. Document any observation or corrective action in the case narrative.
Matrix Spike Analysis (Metals, mercury, cyanide)	Collected one per 20 samples or one per matrix (for less than 20 samples) Samples from the investigation must be used for MS/MSD analysis.	Recovery within laboratory control limits or 75-125%, or in-house laboratory limits. Recovery does not apply if sample concentration > 4 X spike concentration. Spike must contain all analytes. The lowest acceptable laboratory control limits for recovery will be 10%.	1. Analyze post-digestion/post-distillation spike at two times the QL or two times the indigenous level, whichever is greater. 2. Document any observation or corrective action in the case narrative.
Post-Digestion Spike (Recommended for Metals, mercury, cyanide)	Spike must contain all target elements. Performed every 20 samples as necessary.	Recovery within 80-120%of true value.	1. Dilute sample and reanalyze. 2. Recovery of the reanalysis must be 90-110% of the original analysis. 3. If recovery is outside limits, document in the case narrative. 4. Standard additions may be used to compensate for matrix effects.
Internal standard	*Monitored for all samples, blanks, standards, and QC samples analyzed.*	*Internal Standard counts must be within 30% of Internal Standard counts of the calibration standard for all samples and standards.*	*1. If internal standard area is not within 30%, review the internal areas of the closest calibration blanks for compliance. If the calibration blanks meet criteria; dilute the sample five fold and reanalyze.* *2. If the internal standard area of the calibration blank is also outside of 30%, stop sample analysis and recalibrate.*

TABLE 3-5. METALS, MERCURY AND TOTAL CYANIDE QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits *(Criteria for 6010C ,6020 ,6020A, 7471B, and 9012B)*	Corrective Action
Laboratory Duplicate or Matrix Spike Duplicate Analysis	Collected one per 20 samples or one per matrix (for less than 20 samples) Samples from the investigation must be used for Laboratory Duplicate and MSD analysis	Laboratory control limit or 20% for RPD shall be used for original and duplicate sample values greater than or equal to five times the QL. A control limit of the QL value shall be used if either the sample or duplicate value is less than five times the CRQL.	1. Investigate problem and reanalyze. 2. Document any observation or corrective action in the case narrative.
Field Duplicate Analysis	Field collected – One for each matrix; every 20 samples of similar matrix. The field duplicate identification will not be provided to the laboratory.	Validation criteria: 50% RPD for waters and 100% RPD for solids. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.
Percent solids	For solid samples, the percent solids will be determined and sample results will be corrected for percent solids.	Not applicable	Not applicable
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable
IDL Determination for ICP	Recommended within 30 days of the start of analysis and semiannually.	Not applicable	Not applicable
MDL Determination	Before any field samples are analyzed, the MDLs shall be determined for non-prepared analyses, each digestion procedure and instrument used, prior to the start of analyses, and annually thereafter.	Not applicable	Not Applicable
Linear Range Analysis for ICP	Every 6 months must be routinely monitored by analysis of high concentration standard.	Results for high point standard must be within 10% of true value.	Not applicable
Interelement Correction For ICP	Within 6 months of the start of analysis and annually. Correction factors for Al, Ca, Fe, and Mg must be reported and for others if they are applied.	Not applicable	Not applicable
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable
Dilutions	1. When target analyte concentration exceed upper limit of calibration curve. 2. When matrix interference demonstrated by lab and documented in the case narrative. 3. Laboratory will note in the data deliverables which analytical runs were reported.	Not applicable	Not applicable

TABLE 3-5. METALS, MERCURY AND TOTAL CYANIDE QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits *(Criteria for 6010C ,6020 ,6020A, 7471B, and 9012B)*	Corrective Action
Deliverables	1. Full deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.
Method and QCD requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods that are currently used by the laboratory. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with the QAO will be documented and included in the data packages.

Source: O'Brien & Gere

TABLE 3-6. GLYCOLS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8015B)	Corrective Action
Applies to: USEPA Methods 8000C/8015B			
Holding times	Samples must be analyzed within holding time.	Analyze within 14 days from collection.	1. If holding times are exceeded for initial or any re-analyses required due to QC excursions. 2. Notify QAO since re-sampling may be required. 3. Document any observations and corrective action in the case narrative.
Initial Calibration	Prior to sample analysis and when calibration verifications criteria are not met. Initial calibration will contain all target analytes in each standard. Quantitation of analyses will utilize the initial calibration results.	1. A minimum of five concentrations and one calibration standard must be at concentration less than or equal to the QL. 2. If RSD <20% the average RRF (internal calibration) or average calibration factor (external calibration) is used for quantitation. If RSD >20% a linear regression calibration that does not pass through the origin with a correlation coefficient (r) >0.990 is used for quantitation; or a nonlinear first or second order calibration curve with a coefficient of determination (COD) or $r^2 \geq 0.990$.is used for quantitation.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document corrective action in the case narrative. 4. Samples should not be analyzed until calibration control limit criteria are met.
Calibration Verification	Calibration standards must contain all target analytes at mid-range concentration. Minimally, analyze calibration standards daily and every 12 hours during sequence. Calibration verification standards should be analyzed every 20 samples.	1. Response (% difference) or concentration (% drift) < 15%.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document any observations and corrective action in the case narrative; samples should not be analyzed until calibration control limit criteria are met.

TABLE 3-6. GLYCOLS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8015B)	Corrective Action
Applies to: USEPA Methods 8000C/8015B			
MS/MSD Analysis	1 per 20 samples of similar matrix may be prepared at the same times. For MS/MSDs analyzed, must be spiked with all target analytes. Samples from the investigation must be used for MS/MSD analysis.	Recovery and RPD within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if <10%. 2. If reanalysis is still <10%, report both analyses and document in the case narrative. 3. If re-analysis is >10%, document in case narrative; no additional corrective action required. 4. Document any observations and corrective action in the case narrative.
Surrogate Spike	Samples, blanks, MS/MSDs, and LCSs may be spiked with surrogate compounds.	Recovery within laboratory control limits. The lowest acceptable control limits for recovery will be 10%. Corrective action is not required if one of the four surrogates (for two columns) has recovery outside of control limits if the recovery is >10% and the remaining three surrogates are within control limits. Surrogate recoveries for each surrogate on each column must be provided in a summary form.	1. Reanalyze. 2. If reanalysis recovery fails criteria but is >10%, report both analyses and document in case narrative report. 3. If reanalysis recovery is <10%, re-extract and reanalyze the sample. 4. Document any observations and corrective action in the case narrative.
Retention Time Windows	Retention time windows must be established for each target analyte.	Compounds must be within established retention time windows or within laboratory established relative retention time criteria for the associated calibration standards. Retention time windows must be provided for each calibration verification.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate; reanalyze samples back to last compliant calibration standard. 3. Document any observations and corrective action in the case narrative.

TABLE 3-6. GLYCOLS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8015B)	Corrective Action
Applies to: USEPA Methods 8000C/8015B			
Preparation Blank Analysis	One for every 20 samples of similar matrix extracted at the same time.	Target analyte concentrations must be <QL. QLs will be provided with preparation blank results.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument, recalibrate analytical system, and reanalyze all samples if detected for same compounds as in blank. 3. Document any observations and corrective action in the case narrative - samples cannot be analyzed until blank criteria have been met.
Trip Blank	One per cooler containing glycol/alcohol samples	Target analyte concentrations must be <QL. QLs will be provided with preparation blank results.	Document in case narrative.
Laboratory Control Sample Analysis	1 per 20 samples of similar matrix extracted at the same times. Prepared independently from calibration standards. Spike must contain all target analytes and should be at a concentration, which is in the lower 1/2 of the calibration curve.	Recovery within laboratory control limits. The lowest acceptable control limits for recovery will be 10%.	1. If recovery failures are above control limits and these compounds are not detected in the associated samples, corrective action is not required. 2. If recovery failures are below control limits, reanalyze LCS. 3. If re-analysis fails, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document any observations and corrective action in the case narrative.

TABLE 3-6. GLYCOLS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8015B)	Corrective Action
Applies to: USEPA Methods 8000C/8015B			
Identification	Samples, blanks, and QC data.	Retention times must be within established retention time windows or must meet relative retention time criteria. Confirmation analysis is required. Retention time windows must be provided for each calibration verification. USEPA Form 10 Summary or equivalent form, providing the percent difference and retention times for all detected target analytes in samples and QC samples, will be provided. Percent difference calculation: Difference between Higher concentration of sample and Lower concentration of sample divided by the Lower concentration of sample times 100.	1. Investigate problem; reanalyze calibration standards to check for retention time shift. 2. Document any observations and corrective action in the case narrative.
Quantitation	Samples, blanks, and QC data.	Verify concentration is within linear calibration range of standards. Every effort must be made to meet specified QL requirements. Soil samples concentrations must be corrected to dry weight. Lab must state the technique used to quantitate results for the samples.	1. If concentration is above linear calibration range, dilute sample and reanalyze. Dilution should result in concentration in the upper calibration range of the instrument. 2. Document any observations and corrective action in the case narrative.
Equipment Blank Analysis	Field collected - One for each piece of sampling equipment and after every 20 samples.	Compounds concentrations must be <QL.	1. Investigate problem; reanalyze to verify laboratory cross contamination is not a factor. 2. Document any observations and in the case narrative.

TABLE 3-6. GLYCOLS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8015B)	Corrective Action
Applies to: USEPA Methods 8000C/8015B			
Field Duplicate Analysis	Field collected - One for every 20 samples or one per matrix (for less than 20 samples) Field duplicate will not be identified to the laboratory.	Validation criteria: 50% RPD for waters, 100% RPD for solids. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.
Chromatography Presentation	For each standard, sample and QC sample analysis.	Copies of chromatograms provided in the data package must be large enough to view during validation; detail of each peak involved in the identification, including peak shape and associated baseline. In the case that matrix interference is detected or manual integration is performed, enlarged copies of those manipulations will be included in the data package for review.	1. Provide requested information.
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages. USEPA Form 8 Summary form, providing the date, time of analysis of samples and QC samples will be provided.	Not applicable	Not applicable
Laboratory control limits	1. Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable

TABLE 3-6. GLYCOLS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8015B)	Corrective Action
Applies to: USEPA Methods 8000C/8015B			
Dilutions	2. When target analyte concentration exceed upper limit of calibration curve. 3. When matrix interference demonstrated by lab and documented in the case narrative (highly viscous samples or a large number of non-target peaks on the chromatogram). 4. Laboratory will note in the data deliverables which analytical runs were reported.	1. The reagent blank will meet the method blank criteria.	1. Reanalyze reagent blank until method blank criteria are met.

TABLE 3-6. GLYCOLS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits (Criteria for 8000C/8015B)	Corrective Action
Applies to: USEPA Methods 8000C/8015B			
Deliverables	1. Full deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided for one of the first data packages provided for the project or other arrangements will be made to evaluate standard tracing. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.

TABLE 3-6. GLYCOLS QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Method and QAPP requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Note
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods that are currently used by the laboratory. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with the QA Officer will be documented and included in the data packages.

Source: O'Brien & Gere

TABLE 3-7A. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7196A QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Holding Times	Samples must be digested and analyzed within holding time.	Aqueous samples: Analyze within 24 hours from collection.	1. If holding times are exceeded for initial or any re-analyses required, notify the QAO immediately since re-sampling may be required. 2. Document corrective action in the case narrative.
Calibration	1. To compensate for possible slight losses of chromium during digestion or other operations of the analysis, treat the chromium standards by the same procedure as the sample. Accordingly, pipet a chromium standard solution in measured volumes into 250-mL beakers or conical flasks to generate standard concentrations ranging from 0.5 to 5 mg/L Cr(VI) when diluted to the appropriate volume. 2. Develop the color of the standards as for the samples. 3. Transfer a suitable portion of each colored solution to a 1-cm absorption cell and measure the absorbance at 540 nm.	Correlation coefficient for first or second order curve must be greater than or equal to 0.995.	1. Identify and correct problem, recalibrate and reanalyze affected samples. 2. Document corrective action – samples cannot be analyzed until calibration control limit criteria have been met.

TABLE 3-7A. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7196A QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Calibration	4. As reference, use reagent water. Correct the absorbance readings of the standards by subtracting the absorbance of a reagent blank carried through the method. 5. Construct a calibration curve by plotting corrected absorbance values against mg/L of Cr(VI).	Correlation coefficient for first or second order curve must be greater than or equal to 0.995.	3. Identify and correct problem, recalibrate and reanalyze affected samples. 4. Document corrective action - samples cannot be analyzed until calibration control limit criteria have been met.
Calibration Verification	Verify calibration with an independently prepared check standard every 15 samples.	80% to 120% of expected true value	1. Identify and correct problem, recalibrate and reanalyze affected samples. 2. Document corrective action - samples cannot be analyzed until calibration control limit criteria have been met.

TABLE 3-7A. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7196A QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Matrix Interference Verification	For every sample matrix analyzed, verification is required to ensure that neither a reducing condition nor chemical interference is affecting color development. This must be accomplished by analyzing a second 10-mL aliquot of the pH-adjusted filtrate that has been spiked with Cr(VI). The amount of spike added should double the concentration found in the original aliquot. Under no circumstances should the increase be less than 30 µg Cr(VI)/liter.	To verify the absence of an interference, the spike recovery must be between 85% and 115%.	1. If the result of verification indicates a suppressive interference, the sample should be diluted and reanalyzed. 2. If the interference persists after sample dilution, contact Project QAO. Project QAO will evaluate if an alternative method (Method 7195, Co-precipitation, or Method 7197, Chelation/Extraction) should be used. (This decision may require use of an alternate laboratory to evaluate the other sample preparation methods). 3. Acidic extracts that yield recoveries of less than 85% should be retested to determine if the low spike recovery is due to the presence of residual reducing agent. This determination shall be performed by first making an aliquot of the extract alkaline (pH 8.0-8.5) using 1 N sodium hydroxide and then re-spiking and analyzing. If a spike recovery of 85-115% is obtained in the alkaline aliquot of an acidic extract that initially was found to contain less than 5 mg/L Cr(VI), it can be concluded that the analytical method has been verified.
Preparation Blank Analysis	One for each batch of samples digested.	A preparation blank must be prepared and analyzed with each digestion batch, and detected Cr(VI) concentrations must be less than the method detection limit or one-tenth the regulatory limit or action level, whichever is greater.	1. Identify and correct problem, re-digest the entire batch and reanalyze. 2. Document corrective action - samples cannot be analyzed until blank control limit criteria have been met.

TABLE 3-7A. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7196A QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Field/ Equipment Blank Analysis	Collected one per sampling equipment and after every 20 samples.	Detected Cr(VI) concentrations must be less than the method detection limit or one-tenth the regulatory limit or action level, whichever is greater.	1. Investigate problem. 2. Document in case narrative.
LCS Analysis	Every 20 samples. Prepared independently from calibration standards.	Recovery must be within the certified recovery range or a recovery range of 80% to 120% (whichever applies) or the sample batch must be reanalyzed.	1. Correct problem. 2. Reanalyze samples since last satisfactory LCS. 3. Document corrective action.

TABLE 3-7A. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7196A QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Pre-digestion MS Analysis	Samples from the investigation must be used for MS/MSD analysis. If samples were not designated as MS/MSD samples, contact QAO upon receipt of samples at the laboratory. Both soluble and insoluble pre-digestion matrix spikes must be analyzed at a frequency of one each per batch of < 20 field samples. The soluble matrix spike sample is spiked with 1.0 mL of the spiking solution (equivalent to 40 mg Cr(VI)/Kg) or at twice the sample concentration, whichever is greater. The insoluble matrix spike is prepared by adding 10-20 mg of PbCrO to a separate sample aliquot. It is used to evaluate the dissolution during the digestion process. Both matrix spikes are then carried through the digestion process.	An acceptance range for matrix spike recoveries is 75-125%.	1. If MS recoveries are outside of control limits, contact the Project QAO. 2. The entire batch must be reanalyzed if the LCS associated with the batch is outside control limits. 3. If upon reanalysis, the matrix spike is not within the recovery limits, but the LCS is within criteria, consult Figures 1 and 2 and in Section 3.1 of the method. 4. Document corrective action.

TABLE 3-7A. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7196A QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Pre-digestion MS Analysis (Method 3060A)	Samples from the investigation must be used for MS/MSD analysis. If samples were not designated as MS/MSD samples, contact QAO upon receipt of samples at the laboratory.	For Both soluble and insoluble pre-digestion matrix spikes, if the matrix spike recoveries are not within recovery limits, but the LCS is within criteria information such as that specified on Figures 1 and 2 and in Section 3.1 of Method 3060A must be evaluated to interpret ancillary data in conjunction with data on spike recoveries to determine data usability.	See Method 3060A

TABLE 3-7A. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7196A QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Post-digestion MS Analysis	Samples from the investigation must be used for MS/MSD analysis. If samples were not designated as MS/MSD samples, contact QAO upon receipt of samples at the laboratory. A post-digestion Cr(VI) matrix spike must be analyzed per batch. The post-digestion matrix spike concentration should be equivalent to 40 mg/kg or twice the sample concentration observed in the un-spiked aliquot of the test sample, whichever is greater. Dilute the sample aliquot to a minimum extent, if necessary, so that the absorbance reading for both the un-spiked sample aliquot and spiked aliquot are within the initial calibration curve.	The post-digestion matrix spike recovery is 85-115%.	1. Use the corrective actions/guidance on data use specified in Section 8.5 of the method or the Method of Standard Additions (MSA) as specified in Section 8.0 of Method 7000. 2. If the MSA technique is applied post digestion and no spike is observed from the MSA, these results indicate that the matrix is incompatible with Cr(VI) and no further effort on the part of the laboratory is required. These digestates may contain soluble reducing agents for Cr(VI), such as fulvic acids.

TABLE 3-7A. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7196A QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Laboratory Duplicate Analysis	One for each analytical batch.	Duplicate samples must have a Relative Percent Difference (RPD) of < 20%, if both the original and the duplicate are > four times the laboratory QL. A control limit of ± the laboratory QL is used when either the original or the duplicate sample is < four times the laboratory reporting limit.	1. Investigate problem and reanalyze. 2. Report results. 3. Document corrective action.
Field Dup. Analysis	Collected 1 per matrix; every 20 samples of similar matrix	50% RPD for aqueous samples. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis during the validation process.
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable
Dilutions	Dilute samples if they are more concentrated than the highest standard or if they fall on the plateau of a calibration curve.	Not applicable	Not applicable

TABLE 3-7A. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7196A QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Deliverables	1. When requested, full deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes within 5 calendar days of the request.

TABLE 3-7A. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7196A QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Method and QAPP requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with the QAO will be documented and included in the data packages.

TABLE 3-7B. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7199 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Holding Times	Samples must be prepared and analyzed within holding time. For aqueous samples, either in the field or soon after sample collection, adjust the pH of the sample to 9-9.5 by drop wise addition of buffer solution periodically checking the pH with the pH meter or narrow pH-range pH paper	Aqueous: Analyze within 24 hours from collection. Soil: 30 days from collection to extraction. Analyze within 7 days of extraction.	1. If holding times are exceeded for initial or any re-analyses required, notify the QAO immediately since re-sampling may be required. 2. Document corrective action in the case narrative.
Calibration	1. Calibrate using a minimum of a calibration blank and three calibration standards bracketing the anticipated concentration range of the samples. 2. The calibration range must cover no more than two orders of magnitude. Calibration standards should be prepared from the hexavalent stock standard by appropriate dilution using the dilution water in volumetric flasks. 3- Construct a calibration curve of analyte response (peak height or area) versus analyte concentration. The coefficient of correlation for the curve must be 0.999 or greater.	Correlation coefficient for first or second order curve must be greater than or equal to 0.999 or greater.	1. Identify and correct problem, recalibrate and reanalyze affected samples. 2. Document corrective action - samples cannot be analyzed until calibration control limit criteria have been met.
Calibration Verification	Verify calibration with a check standard every 10 samples.	Recovery must be within a recovery range of 90% to 110% of the true value or the sample batch must be reanalyzed.	1. Identify and correct problem, recalibrate and reanalyze affected samples. 2. Document corrective action - samples cannot be analyzed until calibration control limit criteria have been met.

TABLE 3-7B. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7199 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Matrix Interference Verification	Analyze a pH-adjusted project sample spiked with hexavalent chromium so that the final concentration is at the low to mid-level concentration of the calibration curve.	The spike recovery must be within laboratory control limits or between 80% and 120%.	1. Reanalyze if recovery is <30%. 2. If reanalysis is still <30%, report both analyses and document in the case narrative. 3. If >30% and LCS criteria are met, document in case narrative; no additional corrective action required. 4. If >30% and LCS criteria are exceeded also, examine other QC data for source of problem; *i.e.* calibration data for instrument performance issues. 5. Document corrective action in the case narrative
Preparation /Method Blank Analysis	One for each batch of samples digested/prepared.	Hexavalent chromium must be less than QL concentration.	1. Identify and correct problem, re-prepare the entire batch and reanalyze. 2. Document corrective action - samples cannot be analyzed until blank control limit criteria have been met.
Field/Equipment Blank Analysis	Field collected - One per sampling event, or one per 20 samples or one per matrix (for less than 20 samples)	Hexavalent chromium must be less than QL concentration.	1. Investigate problem. 2. Document any observation or corrective action in the case narrative.
Laboratory Control Sample Analysis	Every 20 samples or one for each digestion batch. Prepared independently from calibration standards.	Recovery must be within the certified recovery range or a recovery range of 80% to 120% (whichever applies) or the sample batch must be reanalyzed.	1. Stop analysis. 2. Correct problem. 3. Reanalyze samples since last satisfactory LCS. 4. Document any observation or corrective action in the case narrative.
Laboratory Duplicate Analysis	One for each analytical batch.	Duplicate samples must have a Relative Percent Difference (RPD) of < 20%, if both the original and the duplicate are > four times the laboratory QL. A control limit of ± the QL is used when either the original or the duplicate sample is < four times the laboratory QL.	1. Investigate problem and reanalyze. 2. Report results. 3. Document any observation or corrective action in the case narrative.
Field Duplicate Analysis	Field collected - one per 20 samples or one per matrix (for less than 20 samples) The field duplicate identification will not be provided to the laboratory.	Validation criteria: 50% RPD for waters and 100% RPD for solids. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis during the validation process.

TABLE 3-7B. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7199 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable
Dilutions	Dilute samples if they are more concentrated than the highest standard or if they fall on the plateau of a calibration curve.	Not applicable	Not applicable
Deliverables	1. When requested, full deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.

TABLE 3-7B. HEXAVALENT CHROMIUM USING USEPA METHODS 3060A/7199 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Method and QAPP requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with the QA Officer will be documented and included in the data packages.
Source: O'Brien & Gere

TABLE 3-8. AMMONIA USING USEPA METHOD 350.1, NITRATE USING USEPA METHOD 353.2, NITRITE USING USEPA METHOD 353.2 AND SULFATE USING USEPA METHOD 300.0 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Holding Times	Samples must be prepared and analyzed within holding time.	Nitrite, Nitrate: Analyze 48 hours from collection. Ammonia, Sulfate: Analyze 28 days from collection.	1. If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the Quality Assurance Officer (QAO) since re-sampling may be required.
Initial Calibration and Calibration Verification (ICV, CCV) Applies to methods utilizing calibrations.	At a minimum three to five standards (depending on method requirements) and a blank, prior to sample analysis and when calibration verification criteria are not met.. One standard must be at the QL concentration. ICV accompanies each initial calibration. CCV is analyzed following calibration, after every 10 samples and at the end of the sequence to bracket sample analyses. For total cyanide, the ICV must be distilled.	Linear calibration using response factor with RSD less than or equal to 10%. If RSD <10% the average calibration factor (external calibration) is used for quantitation. For compounds with RSD greater than 10% use linear calibration that does not pass through the origin with least squares regression (r for un-weighted least squares regression, Coefficient of Determination or r2 must be greater than 0.995) or non-linear calibration using no more than third order with seven standards, (COD or r2 must be greater than 0.995). For ICV, CCV - 90% to 110% of expected value.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document corrective action in the case narrative - samples cannot be analyzed until calibration criteria have been met.
Calibration Blank Applies to methods utilizing calibrations.	At beginning and end of run and at a rate of 10% during run.	The absolute value of the target analyte must be less than QL.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document corrective action in the case narrative 4. Samples cannot be analyzed until blank control limit criteria have been met.
Preparation/Method Blank Analysis	1 per batch of samples prepared in the sample batch.	Target analytes less than QL.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument and recalibrate analytical system and re-preparation and reanalyze affected samples if detected. 3. Document corrective action - samples cannot be analyzed until blank criteria are met.

TABLE 3-8. AMMONIA USING USEPA METHOD 350.1, NITRATE USING USEPA METHOD 353.2, NITRITE USING USEPA METHOD 353.2 AND SULFATE USING USEPA METHOD 300.0 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Laboratory Control Sample Analysis	Every 20 samples or each preparation batch. Prepared independently from calibration standards.	Recovery within laboratory control limits or 80% to 120%. The lowest acceptable control limits for recovery will be 10%.	1. If recovery failures are above control limits and these target analytes are not detected in the associated samples, no corrective action is required. 2. If recovery failures are below the control limits, reanalyze LCS and examine results of other QC analyses. 3. If other QC criteria have not been met, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document corrective action in the case narrative.
Matrix Spike Analysis	Collected per project requirements. Samples from the investigation must be used for MS/MSD analysis. If samples were not designated as MS/MSD samples, contact QAO upon receipt of samples at the laboratory.	Recovery within laboratory control limits or 75-125%. Recovery does not apply if sample concentration > 4 X spike concentration. Spike must contain all analytes. The lowest acceptable laboratory control limits for recovery will be 10%.	1. Analyze post-digestion/post-distillation spike at two times the QL or two times the indigenous level, whichever is greater 2. Document corrective action in the case narrative.
Laboratory Duplicate or Matrix Spike Duplicate Analysis	Collected per project requirements. Samples from the investigation must be used for Laboratory Duplicate and MSD analysis. If samples were not designated as QC samples, contact QAO upon receipt of samples at the laboratory.	Laboratory control limit or 20% for RPD shall be used for original and duplicate sample values greater than or equal to five times the QL. A control limit of the QL value shall be used if either the sample or duplicate value is less than five times the QL.	1. Investigate problem and reanalyze. 2. Document corrective action in the case narrative.
Field / Equipment Blank Analysis	Collected per project requirements.	Target analytes less than QL.	1. Investigate problem. 2. Document in the case narrative.
Field Duplicate Analysis	Collected per project requirements.	Validation criteria: 50% RPD for waters, 100% RPD for solids. For sample results that are less than or equal to five times the QL, the criterion of plus or minus two times the QL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.

TABLE 3-8. AMMONIA USING USEPA METHOD 350.1, NITRATE USING USEPA METHOD 353.2, NITRITE USING USEPA METHOD 353.2 AND SULFATE USING USEPA METHOD 300.0 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Dilutions	Dilute and reanalyze samples with concentrations that are greater than the linear range of the instrument or method technique. The laboratory will note in the data package which analytical runs were used to report the sample results.	Not applicable	Not applicable. .
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable
Deliverables	1. When requested, Full deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.

TABLE 3-8. AMMONIA USING USEPA METHOD 350.1, NITRATE USING USEPA METHOD 353.2, NITRITE USING USEPA METHOD 353.2 AND SULFATE USING USEPA METHOD 300.0 QUALITY CONTROL REQUIREMENTS AND CORRECTIVE ACTIONS

Audit	Frequency	Control Limits	Corrective Action
Method and QAPP requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Note
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods. Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with O'Brien & Gere will be documented and included in the data packages.

Source: O'Brien & Gere

FIELD SAMPLING AND ANALYSIS PLAN (FSAP) ADDENDUM

Select sections of the project Field Sampling and Analysis Plan (FSAP) (O'Brien and Gere Engineers, 2013) are updated herein to address field investigation activities that are proposed in the *Groundwater Remedy Pre-Design Investigation and Supplemental Sampling Work Plan* but not previously included in the FSAP or an addendum. Specifically, the additional activities include sampling and analysis for analytes and parameters not previously included in the remedial investigation, the use of Bio-Trap® samplers, and microcosm treatability testing. Sampling for poly- and perfluoroalkyl substances (PFAS) in particular requires specific sampling equipment, personal protective equipment (PPE), and procedures distinct from those used for other target analytes.

Section 7: Groundwater Sampling Procedures

High-density polyethylene (HDPE) tubing will be used for groundwater purging and analytical sampling for all analytes and parameters. Teflon-lined tubing has been used in the past, but cannot be used for PFAS sampling. HDPE tubing does not contain PFAS and is inert to volatile organic compounds (VOC) and other analytes.

Section 7.2: Specialized Sampling Methods

Refer to the *Poly- and Perfluorinated alkyl substances (PFAS) Field Sampling Guidance* (Arcadis 2017) for detailed sampling protocols for collecting groundwater samples for PFAS analysis.

Bio-Trap® samplers are a specialized sampling device for subsurface microbial communities. Bio-Trap® samplers will be provided by Microbial Insights (Knoxville, Tennessee). Microorganisms colonize the sampler during a 30 to 90 day incubation period, then the entire sampling device is sent to the laboratory for analysis of microbial community characteristics. Bio-Trap® samplers will be deployed soon after delivery from the lab. Prior to deployment, samplers will remain sealed and stored on ice or in a refrigerator. Bio-Trap® samplers will not be allowed to freeze, or to sit in ice melt water. Clean gloves will be worn while handing each Bio-Trap® sampler. Bio-Trap® samplers will be deployed at the approximate mid-point of the saturated screened interval at designated monitoring wells. Following retrieval, each Bio-Trap® sampler will be double-bagged and all recovered Bio-Trap® samplers will be shipped to the laboratory for the earliest possible arrival the following day.

Groundwater samples will be collected for microcosm treatability testing in sterile (autoclaved) 2.5-liter amber glass jugs provided by the Arcadis Treatability Laboratory (Durham, North Carolina). The jugs will be filled to near-zero headspace, sealed, and shipped to the laboratory for the earliest possible arrival the following day. Specific shipping instructions will be provided by the laboratory.

Section 12.2.1: Sampling Equipment Decontamination

Field sampling equipment will require cleaning between uses. For groundwater sampling, between uses, decontaminate the flow-through cell and any non-dedicated equipment (i.e., interface probe or depth to water meter) that comes into contact with well water. Detergent should be free of PFAS or 1,4-dioxane.

For example, trace concentrations of 1,4-dioxane may be present in Liquinox® and Dawn® dishwashing detergent.

After donning a new pair of nitrile gloves:

- Rinse sampling equipment with detergent. Scrub equipment with a plastic brush if needed;
- Rinse two times with distilled water or deionized water;
- Rinse one time with “PFAS-free” water; and
- Collect all rinsate in a sealed pail for disposal. Do not reuse decontamination solutions between sampling locations.

Some sampling containers for other analyses may not be PFAS-free. Therefore, PFAS samples will be collected first, and sampling containers for PFAS will remain separate from other sampling containers.

Do not place the decontaminated equipment on aluminum foil or wrap equipment in aluminum foil. Do not allow sampling equipment components to come into to contact with the following materials:

- aluminum foil;
- low-density polyethylene (LDPE);
- glass;
- polytetrafluoroethylene (PTFE, Teflon™) materials, including sample bottle cap liners with a PTFE layer; or
- plumbers thread seal tape.

QUALITY ASSURANCE PROJECT PLAN (QAPP) ADDENDUM

Select sections of the project Quality Assurance Project Plan (QAPP) (O'Brien and Gere Engineers, 2013) are updated herein to address analytical methods that are proposed in the *Groundwater Remedy Pre-Design Investigation and Supplemental Sampling Work Plan* but not previously included in the QAPP or an addendum. Specifically, the additional analytical methods include aldehydes, low detection level 1,4-dioxane, poly- and perfluoroalkyl substances (PFAS), total petroleum hydrocarbons (TPH), dissolved gases, various geochemical indicator parameters, and the use of Bio-Trap® samplers.

Section 2.2.1: Laboratory Analysis

Currently, the Environmental Laboratory Approval Program (ELAP) does not offer certification for PFAS compounds in matrices other than finished drinking water. However, laboratories analyzing environmental samples (e.g. groundwater) are required, by the Division of Environmental Remediation, to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537 or ISO 25101 (New York State Department of Environmental Conservation 2018).

Section 7.3.4: Field/Equipment Blank Sampling Procedure

Field/equipment blanks for PFAS samples are described in the attached *Poly- and Perfluorinated alkyl substances (PFAS) Field Sampling Guidance* (Arcadis 2017).

QAPP Tables

See attached for applicable updates.

Table 1 – Field Sampling Summary

Table 2-5 – Laboratory Detection Limits and Regulatory Criteria for New Methods

Table 2-6 – Laboratory Detection Limits and Regulatory Criteria for Full PFAS Target Analyte List

Table 3-2 – SVOC Quality Control Requirements and Corrective Actions

Table 3-9A – General Chemistry QC Samples

Table 3-9B – Analytical Instrument Calibration for General Chemistry Parameters

Table 3-10A – TPH QC Samples

Table 3-10B – Analytical Instrument Calibration for TPH

Table 3-11A – PFAS QC Samples

Table 3-11B – Analytical Instrument Calibration for PFAS

Table 3-12 – Methane, Ethane, Ethene, and Acetylene Quality Control Requirements and Corrective Actions

Table 3-13A – Aldehydes QC Samples

Table 3-13B – Analytical Instrument Calibration for Aldehydes

References

Arcadis U.S., Inc. 2017. Poly- and Perfluorinated alkyl substances (PFAS) Field Sampling Guidance. April 27. Rev 0.

New York State Department of Environmental Conservation. Joshua P. Cook to Michael E. Furlong (Bristol-Myers Squibb). Letter dated 5 April 2018.

O'Brien and Gere Engineers. 2013a. Field Sampling and Analysis Plan: BMS Syracuse North Campus Restoration Area Site No. C734138. March.

O'Brien and Gere Engineers. 2013b. Quality Assurance Project Plan: BMS Syracuse North Campus Restoration Area Site No. C734138. March.

QAPP Tables

Table 1 – Field Sampling Summary

Parameter and Method	Matrix	Sample Container and Volume	Preservation	Holding Times	Number of Samples	QC Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Aldehydes – USEPA Method 8315A	GW	250-mL round glass	4°C	3 d	62	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
1,4-Dioxane (low-level) – USEPA Method 8270 SIM	GW	1-one liter amber glass container with Teflon™ lined screw caps	4°C	7 d from collection to extraction; 40 d from extraction to analysis	62	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
PFAS – USEPA Modified EPA Method 537	GW	250-mL wide mouth plastic	4 ± 2ºC[1]	14 d from collection to extraction; 28 d from extraction to analysis	22	One per sample batch, not to exceed 20 samples	NA	One per sample batch, not to exceed 20 samples	One per sample batch, not to exceed 20 samples. See Section 7.3.4 for further QC detail.
Anions (chloride, fluoride, sulfate) – USEPA Method 300.0	GW	50-mL plastic tube	4°C	28 d	32	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
Alkalinity – Standard Method 2320B	GW	250-mL wide mouth plastic	4°C	14 d	32	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix

Parameter and Method	Matrix	Sample Container and Volume	Preservation	Holding Times	Number of Samples	QC Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Total Organic Carbon – Standard Method 5310C	GW	40-mL amber vial	H_3PO_4, 4°C	28 d	32	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
Total phosphorus – Standard Method 4500-PF	GW	250-mL wide mouth plastic	H_2SO_4, 4°C	28 d	32	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
Chemical Oxygen Demand (COD) – USEPA Method 410.4	GW	250-mL wide mouth plastic	H_2SO_4, 4°C	28 d	32	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
Biological Oxygen Demand (BOD) – Standard Method 5210 B	GW	500-mL round plastic	4°C	48 h	32	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
TPH-G – USEPA Method 8015D	GW	40-mL glass vial	HCl, 4°C	14 d	6	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
TPH-D/O – USEPA Method 8015D	GW	250-mL round amber glass	HCl, 4°C	7 d	6	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
Methane, ethane, ethene, acetylene – Pace Analytical internal method AM20GAX	GW	3-40 mL clear glass bottle	Na_3PO_4, 4°C	14 d	32	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix

Parameter and Method	Matrix	Sample Container and Volume	Preservation	Holding Times	Number of Samples	QC Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Treatability Testing Groundwater Samples	GW	2.5 L per experiment	4°C until microcosms are prepared	1 month	5	NA	NA	NA	NA
Deoxyribonucleic acid (DNA) and messenger ribonucleic acid (mRNA) extraction and quantitative polymerase chain reaction (qPCR)	Microbial cells	Bio-Trap®	Storage on ice	DNA: 48 hours, mRNA: 24 hours	7	NA	NA	NA	NA

Acronyms:
GW = groundwater
NA = not applicable

Note:
1. Do not use blue ice. Store PFAS samples in separate cooler from other types of samples.

Table 2-5 – Laboratory Detection Limits and Regulatory Criteria for New Methods

Target Analyte	CAS Number	Method	Laboratory QL Aqueous	Laboratory MDL Aqueous[1]	Class GA Groundwater[2]
Aldehydes: Acetaldehyde	75-07-0	USEPA Method 8315A	60	30	NA
Aldehyde: Formaldehyde	50-00-0	USEPA Method 8315A	50	20	NA
1,4-Dioxane	129-91-1	USEPA Method 8270 SIM	0.3 ug/L	0.1 ug/L	NA
PFAS	See Table 2-6	USEPA Method 537	See Table 2-6	See Table 2-6	NA
Anion: chloride	16887-00-6	USEPA Method 300.0	2,000 ug/L	1,000 ug/L	250,000
Anion: fluoride	16984-48-8	USEPA Method 300.0	500 ug/L	250 ug/L	1,500
Alkalinity	NA	Standard Method 2320B	5,000 ug/L as $CaCO_3$	1,700 ug/L as $CaCO_3$	NA
Total Organic Carbon	NA	Standard Method 5310C	1,000 ug/L	500 ug/L	NA
Total phosphorus	7723-14-0	Standard Method 4500-PF	100 ug/L	50 ug/L	NA
Chemical Oxygen Demand (COD)	NA	USEPA Method 410.4	50,000 ug/L	12,800 ug/L	NA
Biological Oxygen Demand (BOD)	NA	Standard Method 5210 B	2,000 ug/L	2,000 ug/L	NA
TPH-G by Method 8015D	PHCG	USEPA Method 8015D	50 ug/L	20 ug/L	NA
TPH-D by Method 8015D	PHCDC10C28	USEPA Method 8015D	100 ug/L	45 ug/L	NA
TPH-O by Method 8015D	PHCO>C28C40	USEPA Method 8015D	100 ug/L	45 ug/L	NA
Methane, ethane, ethene, acetylene	74-82-8, 74-84-0, 74-85-1, 74-86-2	Pace Analytical Method AM20GAx	0.50 ug/L[3], 0.10 ug/L[3], 0.10 ug/L[3], 0.50 ug/L[3]	To be determined	NA

Acronyms:
MDL = method detection limit
QL = quantitation limit

Notes:
[1] Maximum MDLs allowed per NYSDEC letter are provided.
[2] Class GA Groundwater Standards and Guidance values as listed in T.O.G.S 1.1.1; Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations; June 1998, current as of May 2018.
[3] AM20GAx laboratory reporting limits are provided.

Table 2-6 – Laboratory Detection Limits and Regulatory Criteria for Full PFAS Target Analyte List

Group	Chemical Name	Abbreviation	CAS Number	Laboratory QL Aqueous	Laboratory MDL Aqueous[1]	Class GA Groundwater[2]
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5	1.0	0.30	NA
	Perfluorohexanesulfonic acid	PFHxS	355-46-4	2.0	0.40	NA
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8	2.0	0.40	NA
	Perfluorooctanessulfonic acid	PFOS	1763-23-1	2.0	0.40	NA
	Perfluorodecanesulfonic acid	PFDS	335-77-3	2.0	0.60	NA
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4	6.0	2.0	NA
	Perfluoropentanoic acid	PFPeA	2706-90-3	6.0	2.0	NA
	Perfluorohexanoic acid	PFHxA	307-24-4	2.0	0.40	NA
	Perfluoroheptanoic acid	PFHpA	375-85-9	1.0	0.30	NA
	Perfluorooctanoic acid	PFOA	335-67-1	1.0	0.30	NA
	Perfluorononanoic acid	PFNA	375-95-1	2.0	0.40	NA
	Perfluorodecanoic acid	PFDA	335-76-2	2.0	1.0	NA
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8	2.0	0.40	NA
	Perfluorododecanoic acid	PFDoA	307-55-1	1.0	0.30	NA
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8	1.0	0.30	NA
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7	1.0	0.30	NA
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2	2.0	1.0	NA
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4	6.0	2.0	NA
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6	3.0	1.0	NA
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9	3.0	1.0	NA
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6	3.0	1.0	NA

Reference:
New York State Department of Environmental Conservation. 2018.

Acronyms:
MDL = method detection limit
QL = quantitation limit

Notes:
[1] Maximum MDLs allowed per NYSDEC letter are provided.
[2] Class GA Groundwater Standards and Guidance values as listed in T.O.G.S 1.1.1; Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations; June 1998, current as of May 2018.

QAPP Table 3-2 – SVOC Quality Control Requirements and Corrective Actions

The quality control requirements and corrective actions included in the QAPP (O'Brien and Gere Engineers 2013b) for USEPA Methods 8000C/8270C/8270D apply to USEPA Method 8270 SIM, which will be used for 1,4-dioxane analysis.

QAPP Table 3-9A – General Chemistry QC Samples

Matrix	**Water**					
Analytical Group	**Total Organic Carbon (TOC), Chloride, Fluoride, Total Alkalinity, Total Phosphorus, Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD)**					
Analytical Method	**TOC: SM 5310C; Chloride and Fluoride: EPA 300.0; Total Alkalinity: SM2320B; Total Phosphorus: SM 4500-PF; COD: USEPA 410.4; BOD: SM5210B**					
QC Sample	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action**	**Person Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**
Laboratory Duplicate	One per preparatory batch	Per laboratory SOPs	Correct problem, then reanalyze all samples processed with the duplicate	Laboratory analyst	Precision	RPD of ≤ 20% for duplicate results greater than or equal to 5-times the RL
MS/MSD (if applicable)	One per preparatory batch	Per laboratory SOPs	Identify problem, then reanalyze MS/MSD and all associated batch samples	Laboratory analyst	Precision/ Accuracy	Within laboratory in-house limits
Method Blank	One per preparatory batch	Per laboratory SOPs	Correct problem, then reanalyze method blank and all samples processed with the contaminated blank	Laboratory analyst	Sensitivity	No target analytes detected greater than one-half QL and 1/10 the amount measured in any sample or 1/10 regulatory limit (whichever is greater)
LCS	One per preparatory batch	Per laboratory SOPs	Identify problem, then reanalyze LCS and all associated batch samples	Laboratory analyst	Accuracy	Within laboratory in-house limits

QAPP Table 3-9B – Analytical Instrument Calibration for General Chemistry Parameters

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA
Autoanalyzer (TOC)	ICAL	Daily prior to sample analysis	$r^2 \geq 0.995$	Recalibrate	Assigned Laboratory Personnel
	ICV	Once after each ICAL, prior to sample analysis	Within ± 10% of expected value	Recalibrate	
	CV	After every 10 samples and at the end of the analysis sequence	Within ± 10% of expected value	Recalibrate, rerun 10 samples previous to failed CV	
IC (Chloride/ Fluoride)	ICAL	Weekly prior to sample analysis	$r^2 \geq 0.995$	Recalibrate	Assigned Laboratory Personnel
	ICV	Once after each ICAL, prior to sample analysis	Within ± 10% of expected value	Recalibrate	
	CV	After every 10 samples and at the end of the analysis sequence	Within ± 10% of expected value	Recalibrate, rerun 10 samples previous to failed CV	
Titration (Alkalinity)	CV	Prior to sample analysis	RSD 20%	Recalibrate and rerun samples	Assigned Laboratory Personnel
Spectrophotometer (Phosphorus)	ICAL	Daily prior to sample analysis	$r^2 \geq 0.995$	Recalibrate	Assigned Laboratory Personnel
	ICV	Once after each ICAL, prior to sample analysis	Within ± 10% of expected value	Recalibrate	
	CV	After every 10 samples and at the end of the analysis sequence	Within ± 10% of expected value	Recalibrate, rerun all samples previous to failed CV	

QAPP Table 3-10A – TPH QC Samples

Matrix	**Soils/Solids**					
Analytical Group	**TPH-GRO, TPH-DRO**					
Analytical Method/SOP Reference	**SW-846 8015B Per laboratory SOP**					
QC Sample	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action**	**Person Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**
MS/MSD	One per preparatory batch	Per laboratory SOP	Identify problem, then reanalyze MS/MSD and all associated batch samples	Laboratory analyst	Precision/ Accuracy	Within laboratory in-house limits
Method Blank	One per preparatory batch	Per laboratory SOP	Correct problem, then reanalyze method blank and all samples processed with the contaminated blank	Laboratory analyst	Sensitivity	No target analytes detected greater than one-half QL and 1/10 the amount measured in any sample or 1/10 regulatory limit (whichever is greater)
LCS	One per preparatory batch	Per laboratory SOP	Identify problem, then reanalyze LCS and all associated batch samples	Laboratory analyst	Accuracy	Within laboratory in-house limits
Surrogate Standards	Added to all samples, blanks, LCS, and MS	Per laboratory SOP	Correct problem, then reanalyze affected samples	Laboratory analyst	Accuracy	Within laboratory in-house limits
Continuing Calibration Verification	Every 12 hours period	Per laboratory SOP	Recalibrate and reanalyze all associated samples	Laboratory analyst	Accuracy	The percent difference for the continuing calibration compounds must be < 15%

QAPP Table 3-10B – Analytical Instrument Calibration for TPH

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA
GC/FID (TPH-DRO)	ICAL – 5 point	Initial calibration prior to sample analysis	%RSD <20%	Correct problem, re-calibrate and re-analyze any affected samples	Assigned Laboratory Personnel
	ICV	Once after each initial calibration	Value of second source within ± 20% of expected	Rerun ICV one time, second failure requires recalibration	
	CV	Daily, before sample analysis, every 12 hours of analysis time, and at the end of the analysis sequence	± 20% difference	Re-inject CV; if passes rerun previous 10 samples and continue run; if 2nd CV fails, recalibrate	
GC/PID (TPH-GRO)	ICAL – 5 point	Initial calibration prior to sample analysis	%RSD <20%	Correct problem, re-calibrate and re-analyze any affected samples	Assigned Laboratory Personnel
	ICV	Once after each initial calibration	Value of second source within ± 15% of expected	Rerun ICV one time, second failure requires recalibration	
	CV	Daily, before sample analysis, every 12 hours of analysis time, and at the end of the analysis sequence	± 15% difference	Re-inject CV; if passes rerun previous 10 samples and continue run; if 2nd CV fails, recalibrate	
	Low-level Calibration Check Standard	Daily	All analytes within ± 20% of expected value	Correct problem, then repeat ICAL	
	ICV	Once after each ICAL, prior to sample analysis	Value of second source for all analytes within ± 10% of expected value	Recalibrate	
	CV	After every 10 samples and at the end of the analysis sequence	All analytes within ± 20% of expected value	Recalibrate, rerun 10 samples previous to failed CV	

QAPP Table 3-11A – PFAS QC Samples

Matrix		**Water**				
Analytical Group		**PFAS**				
Analytical Method		**EPA Modified 537**				
QC Sample	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**
Field Duplicate	1 per 20 field samples	Relative percent difference (RPD) ≤ 50% for soil; ≤ 35% for water	Qualify data as appropriate	Data Validator	Overall precision	RPD ≤ 50% for soil; ≤ 35% for water
Method blank	1 per analytical batch of no more than 20 samples	No target analyte concentrations ≥ ½ LOQ	Correct problem. If required, re-prep and reanalyze MB and all QC samples and field samples processed with the contaminated blank.	Analyst / Section Supervisor	Contamination/ bias	No target analyte concentrations ≥ ½ LOQ
Reagent or Equipment blank as appropriate	1 per 20 field samples	No target analyte concentrations ≥ ½ LOQ	Qualify data as appropriate	Data Validator	Contamination/ bias	No target analyte concentrations ≥ ½ LOQ
Laboratory Control Sample (LCS)	1 per analytical batch of no more than 20 samples	Percent recoveries (%R) Lab generated control limits.	Correct problem, then re-prep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes if sufficient sample material is available.	Analyst / Section Supervisor	Accuracy/ bias	Percent recoveries (%R) Lab generated control limits.
Extracted Internal standards (1)	Every field sample, standard, blank, and QC sample.	Added to sample prior to extraction. %R 50 to 150% of true value.	If recoveries are acceptable for QC samples, but not field samples, may indicate matrix effect. If QC samples fail, correct problem; rerun all failed samples, report and narrate	Analyst / Section Supervisor	Accuracy/ bias	%R 50 to 150% of true value.
Injection Internal Standards	Every field sample, standard, blank, and QC sample.	Added just prior to analysis. Peak areas must be within -50% to +50% of area from ICAL midpoint standard.	If peak areas are unacceptable, analyze a second aliquot of extract if enough remains. If not enough extract, reanalyze the first aliquot. If second analysis meets acceptance criteria, report the second analysis. If it fails, either analysis may be reported with the appropriate flags.	Analyst / Section Supervisor	Accuracy/ bias	Peak areas must be within -50% to +50% of area from ICAL midpoint standard

Matrix		Water				
Analytical Group		PFAS				
Analytical Method		EPA Modified 537				
QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix spike / matrix spike duplicate	1 per analytical batch of no more than 20 samples.	Sample spiked with all analytes at concentration ≥ LOQ and ≤ mid-level calibration concentration. %R See Lab generated control limits.	If criteria not met, qualify as appropriate.	Analyst / Section Supervisor	Accuracy/ bias	See Lab generated control limits.

Note:

1. The isotopically labeled analog of an analyte (Extracted Internal Standard Analyte) must be used for quantitation if commercially available (Isotope Dilution Quantitation). If a labeled analog is not commercially available, the Extracted Internal Standard Analyte with the closest retention time to the analyte must be used for quantitation.

QAPP Table 3-11B – Analytical Instrument Calibration for PFAS

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA
LC/MS/MS for PFAS	Mass Calibration	Daily, prior to sample analysis and after performing major maintenance, as required to maintain documented instrument sensitivity and stability performance.	Calibrate the mass scale of the MS with calibration compounds and procedures described by the manufacturer	Retune instrument and peak check tune. Maintenance may be required.	Analyst, Department Manager
	Instrument performance check (tune).	When the masses fall outside of the ±0.5 amu of the true value.	Mass assignments of the tuning standard within 0.5 amu of true value.	Retune instrument and verify	
	Initial Calibration (ICAL) Standards containing both branched and linear isomers must be used when commercially available. Isotope Dilution or Internal Standard Calibration is required. Minimum five-point initial calibration for linear, or six-point calibration for quadratic.	Initial calibration prior to sample analysis	S/N Ratio: ≥ 10:1 for all ions used for quantification. For analytes having a promulgated standard, (e.g., HA levels for PFOA and PFOS), the qualitative (confirmation) transition ion must have a S/N Ratio of ≥ 3:1. Average RF: RSD of the RFs for each analyte ≤ 20% Linear or non-linear Calibration: r^2 ≥ 0.99. Analytes must be within 70-130% of their true value for each calibration standard.	Verify standard solutions still valid, perform instrument maintenance as needed, then repeat the ICAL	
	Instrument Sensitivity Check (ISC). ISC can serve as initial daily CCV	Prior to analysis and at least once every 12 hours	Analyte concentrations must be at LOQ; concentrations must be within ±30% of true value.	Correct problem, rerun ISC. If problem persists, report ICAL.	
	Initial Calibration Verification (ICV)	Once after each ICAL; analysis of second source standard prior to sample analysis.	Analyte concentrations must be within ±30% of true value.	Correct problem, rerun ICV. If problem persists, report ICAL.	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA
	Continuing Calibration Verification (CCV)	Prior to sample analysis, after every 10 field samples, and at end of analytical sequence.	Analyte concentrations must be within ±30% of true value. Concentration of analytes must range from LOQ to mid-level calibration concentrations.	Immediately analyze two additional consecutive CCVs. If both pass, samples may be reported without reanalysis. Otherwise, perform corrective action, repeat CCV (or ICAL) and reanalyze all associated samples since last successful CCV.	
	Instrument Blanks	Immediately following highest standard analyzed and daily prior to sample analysis.	Concentration of each analyte must be ≤ ½ the LOQ.	If acceptance criteria are not met after the highest calibration standard, calibration must be performed using a lower high standard until criteria is met.	
	Continuing calibration – pH standard near the pH of samples	After every 10 samples, and at end of analytical run	pH Check Standard within ± 0.05 su of true value		

Table 3-12 – Methane, Ethane, Ethene, and Acetylene Quality Control Requirements and Corrective Actions

Matrix	**Water**		
Analytical Group	**Methane, ethane, ethene, and acetylene**		
Analytical Method	**AM20GAx**		
Audit	**Frequency**	**Control Limits**	**Corrective Action**
Holding Times	Samples must be extracted and analyzed within holding time.	See Table 1.	If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the QAO since resampling may be required.
Initial Calibration	Initial calibration, immediately followed by initial calibration verification	Initial calibration (ICAL) is accomplished by analyzing multiple standards of appropriate concentration ranges for each detector being readied for sample analysis. A linear fit to an area response versus concentration plot is formed with the origin forced to zero and the calibration is accepted for use if r^2, the coefficient of determination is ≥0.995. If this criterion cannot be met using a linear fit, a quadratic fit can be used. For the quadratic fit, the acceptance criteria is also r^2≥0.995. Initial calibration verification (ICV) is prepared form an alternate source, than that used for the initial calibration standards. The concentration of the ICV is in the middle of the calibration range and is close to that of the ICAL midpoint, but because of the nature of gas standard it is not at exactly that concentration. Acceptance criterion for the ICV is an instrument response within ± 15% drift. Since the instrumentation used routinely monitors the percent recoveries and in this instance percent drift is equal to percent recovery less 100%, the control limits are 85-115% recovery.	If the acceptance criteria specified for initial calibration is not met, the instrument is examined for a cause and a new set of calibration standards are analyzed. If the instrument response for ICV standard is outside the acceptance window of 85 – 115%, the analyst will not analyze samples until either the reason is determined and the problem is corrected, or a new multi-point calibration is analyzed and an acceptable ICV is run using that calibration.
Initial Calibration Blank	Following the ICV	An initial calibration blank follows the ICV. The blank is made up of the instrument flush. Target compounds must not be detected above the reporting limits.	If the blank does not meet the acceptance criterion, another blank is injected until the results are within the acceptance criterion.
Continuing Calibration Verification (CCV)	CCV is analyzed at the beginning and end of each analytical shift and after every 15 field samples	The CCV is prepared from an alternate source than that used for the ICAL standards. The concentration of the CCV is in the middle of the calibration range and is close to that of the ICAL midpoint, but because of the nature of gas standard it is not at exactly that concentration.	Acceptance criterion for the CCV is an instrument response within ± 15% drift. Since the instrumentation used routinely monitors the percent recoveries and in this instance percent drift is equal to percent recovery less 100%, the control limits are 85-115% recovery.

Matrix	**Water**		
Analytical Group	**Methane, ethane, ethene, and acetylene**		
Analytical Method	**AM20GAx**		
Audit	**Frequency**	**Control Limits**	**Corrective Action**
Continuing Calibration Blank	A CCB follows each CCV.	The blanks are made up of the instrument flush. The acceptance criterion for the blank is the result must be less than the reporting limit for all target compounds.	If the blank does not meet the acceptance criterion, another blank is injected until the results are within the acceptance criterion.
Laboratory Method Blank Analysis	A method blank is analyzed with each analytical batch	Water that is free of the principle atmospheric components of nitrogen and oxygen is very difficult to make and similarly difficult to store. Toward that end, the blanks are made up of instrument flush for all of the gases except for blanks for TIC. TIC blanks are made up of deionized water. The acceptance criterion for the blank is the result must be less than the reporting limits for all target compounds.	If the blank does not meet the acceptance criterion, another blank is injected until the results are within the acceptance criterion.
Laboratory Control Sample Analysis	Both and LCS and LCSD are to be run with each analytical batch	The LCS and LCSD are prepared at a mid-range concentration. For samples that arrive as waters, DI water is spiked with a gas mixture of target analytes and prepared the same as the samples. Percent recovery is to be between 80 -120 % and RPD is to be less than or equal to 20%.	If the LCS fails, a new LCS is prepared and analyzed. If the new LCS falls within the acceptance criterion, analysis continues. If the new LCS fails, analysis is stopped, and the overall procedural system is checked for errors. Once the cause is determined, analysis continues and if necessary, discussion placed to the case narrative.
Matrix Spike/Matrix Spike Duplicate Analysis	When client requests and sends sufficient number of aliquots to prepare them	The source used for the MS/MSD will be based upon the methane concentration of the original field sample being spiked; depending upon the detector used for the methane determination. Source water is spiked with a gas mixture of target analytes and prepared the same as the field samples. Percent recovery is to be between 70 – 130% and RPD is to be less than or equal to 20%.	If the matrix spike and spike duplicate fail but all the other quality control samples are within the acceptance criteria, matrix interference is noted in the Case Narrative.

Table 3-13A – Aldehydes QC Samples

Matrix	Water				
Analytical Group	**Aldehydes**				
Analytical Method	**EPA 8315A**				
Quality Control (QC) Sample	**Frequency/ Number[1]**	**SOP QC Acceptance Limits**	**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator**
Field duplicate	One per 10 field samples of similar matrix	Per laboratory SOP	Qualify data as needed	Data Validator	Precision – overall
Surrogates	Two per sample	Per laboratory SOP	Reanalysis or re-extraction/ reanalysis of sample	Lab personnel	Accuracy/bias
Method blanks	One per analytical batch	Per laboratory SOP	Qualify data as needed or re-extraction/ reanalysis of batch	Lab personnel and/or Data Validator	Accuracy/bias contamination
Laboratory control sample/laboratory control sample duplicate (LCS/LCSD)	One per analytical batch	Per laboratory SOP	Reanalysis or re-extraction/ reanalysis of batch	Lab personnel and/or Data Validator	Accuracy/bias
Matrix spike/matrix spike duplicate (MS/MSD)	One per batch	Per laboratory SOP	Qualify data as needed	Lab personnel and/or Data Validator	Accuracy/bias
MS/MSD and LCS/LCSD[2]	One per batch	Per laboratory SOP	Qualify data as needed	Lab personnel and/or Data Validator	Precision

Table 3-13B -- Analytical Instrument Calibration for Aldehydes

Matrix	Water				
Analytical Group	**Aldehydes**				
Analytical Method	**EPA 8315A**				
Instrument	**Calibration Procedure**	**Frequency of Calibration**	**Acceptance Criteria**	**Corrective Action (CA)**	**Person Responsible for CA**
High Performance Liquid Chromatography (HPLC) for 8315A	Initial calibration — prior to sample analysis, a minimum of 5 concentration levels for all compounds.	Prior to sample analysis, 5 points for all compounds. Yearly.	Each compound Calibration Factor (CF) ≤ 20% for all compounds or linear $r^2 \geq 0.99$.	Inspect system, correct problem, rerun calibration and affected samples if CF > 20% or linear $r^2 \geq 0.99$.	Analyst
	Continuing calibration — before sample analysis, 1 standard (midpoint).	Daily or on continuing calibration failure	Each compound percent difference %D ≤ 20%.	Inspect system, correct problem, rerun calibration and affected samples if %D> 20%.	

QUALITY ASSURANCE PROJECT PLAN (QAPP) ADDENDUM #2

Select sections of the project Quality Assurance Project Plan (QAPP) (O'Brien and Gere Engineers, 2013) are updated herein to include groundwater monitored natural attenuation (MNA) parameters which will be sampled in connection with the Thermal IRM planned for the Building 455 Area which were not previously included in the QAPP or an addendum. Specifically, the additional analytical methods include nitrate, ferrous iron, sulfate, methane, nitrogen, phosphorus, and potassium.

QAPP Tables

See attached for applicable updates.

Table 1 – Field Sampling Summary: MNA Parameters

Table 2-7 – Laboratory Detection Limits and Regulatory Criteria for MNA Parameters

Table 3-5 – Metals Quality Control Requirements and Corrective Actions

Table 3-14A – General Chemistry for MNA Parameters QC Samples

Table 3-14B – Analytical Instrument Calibration for General Chemistry for MNA Parameters

Table 3-15 – Methane Quality Control Requirements and Corrective Actions

References

O'Brien and Gere Engineers. 2013b. Quality Assurance Project Plan: BMS Syracuse North Campus Restoration Area Site No. C734138. March.

QAPP Tables

Table 1 – Field Sampling Summary: MNA Parameters

Parameter and Method	Matrix	Sample Container and Volume	Preservation	Holding Times	Number of Samples	QC Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Nitrate as N – USEPA Method 353.2[1,2]	GW	250-mL wide mouth plastic	≤6°C	48 hours	TBD	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
Nitrite as N – USEPA Method 353.2[1,2]	GW	250-mL wide mouth plastic	≤6°C	48 hours	TBD	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Nitrate Nitrite as N – USEPA Method 353.2[1,2]	GW	250-mL wide mouth plastic	H_2SO_4, ≤6°C	28 days	TBD	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Total Kjeldahl Nitrogen – USEPA 351.2[2]	GW	250-mL wide mouth plastic	H_2SO_4, ≤6°C	28 days	TBD	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 20 samples or one per sampling event as required for each matrix
Ferrous Iron – Standard Method 3500-FeB	GW	250-mL amber glass	HCl, ≤6°C	As soon as possible	TBD	One per sample batch, not to exceed 20 samples	NA	One per sample batch, not to exceed 20 samples	One per 20 samples or one per sampling event as required for each matrix
Sulfate and Chloride – USEPA Method 300.0	GW	50-mL plastic tube	≤6°C	28 days	TBD	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix

Parameter and Method	Matrix	Sample Container and Volume	Preservation	Holding Times	Number of Samples	QC Frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Blank
Methane – RSK-175	GW	2-40 mL clear glass bottle	HCl, ≤6°C	14 days	TBD	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
Total phosphorus – Standard Method 4500-PF	GW	250-mL wide mouth plastic	H_2SO_4, ≤6°C	28 days	TBD	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
Potassium – USEPA Method 6010D	GW	250-mL wide mouth plastic	HNO_3, ≤6°C	180 days	TBD	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix
Alkalinity by Standard Method 2320B	GW	250-mL wide mouth plastic	≤6°C	14 days	TBD	One per 20 samples or one per matrix (for <20 samples)	NA	One per 20 samples or one per matrix (for <20 samples)	One per 20 samples or one per sampling event as required for each matrix

Acronyms:
GW = groundwater
HCl = hydrochloric acid
HNO_3 = nitric acid
H_2SO_4 = sulfuric acid
NA = not applicable

Notes:
[1] Nitrate as N can be reported from calculation: Nitrate as N = (Nitrate Nitrite as N) – (Nitrite as N).
[2] Total Nitrogen will be reported from calculation: Total Nitrogen = (Nitrate Nitrite as N) + (Total Kjeldahl Nitrogen)

Table 2-7 – Laboratory Detection Limits and Regulatory Criteria for MNA Parameters

Target Analyte	CAS Number	Method	Laboratory MDL Aqueous[1] (ug/L)	Laboratory QL Aqueous[1] (ug/L)	Class GA Groundwater[2] (ug/L)
Nitrate as N	14797-55-8	USEPA Method 353.2	40	100	10,000
Nitrate Nitrite as N	NA	USEPA Method 353.2	40	100	10,000
Nitrite as N	14797-65-0	USEPA Method 353.2	15	50	1,000
Total Nitrogen	NA	Calculation	NA	NA	10,000
Total Kjeldahl Nitrogen	NA	USEPA Method 351.2	500	1,000	NA
Ferrous Iron	15438-31-0	Standard Method 3500-FeB	50	100	NA
Sulfate	14808-79-8	USEPA Method 300.0	300	1,000	250,000
Chloride	16887-00-6	USEPA Method 300.0	200	400	250,000
Methane	74-82-8	RSK-175	3	5	NA
Total Phosphorus	7723-14-0	Standard Method 4500-PF	50	100	NA
Potassium	7440-09-7	USEPA Method 6010D	204	500	NA
Alkalinity	NA	Standard Method 2320B	2,600	8,000	NA

Acronyms:
MDL = method detection limit
QL = quantitation limit

Notes:
[1] Laboratory QL and MDL provided by Eurofins Lancaster Laboratories Environmental LLC and are current as of the date of this QAPP Addendum. The laboratory will report their most recent QL and MDL at the time of analysis.
[2] Class GA Groundwater Standards and Guidance values as listed in T.O.G.S 1.1.1; Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations; June 1998.

QAPP Table 3-5 – Metals Quality Control Requirements and Corrective Actions

The quality control requirements and corrective actions included in QAPP Table 3-5 Metals by USEPA Methods 6010B/6010C/6020/6020A, mercury by USEPA Methods 7470A/7471A/7471B and Total Cyanide by USEPA Methods 9012A/9012B/9014 (O'Brien and Gere Engineers 2013b) apply to USEPA Method 6010D, which will be used for potassium analysis.

QAPP Table 3-14A – General Chemistry for MNA Parameters QC Samples

Matrix	**Water**		
Analytical Group	**Nitrate as N, Nitrite as N, Nitrate Nitrite as N, Total Kjeldahl Nitrogen, Ferrous Iron, Sulfate, Chloride, Total Phosphorus, Alkalinity**		
Analytical Method	**Nitrate as N, Nitrite as N, and Nitrate Nitrite as N: EPA 353.2; Total Kjeldahl Nitrogen: EPA 351.2; Ferrous Iron: SM3500-FeB; Sulfate and Chloride: EPA 300.0; Total Phosphorus: SM4500-PF; Alkalinity SM2320B**		
Audit	**Frequency**	**Control Limits**	**Corrective Action**
Holding Times	Samples must be analyzed within holding time.	See Table 1.	If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the QAO since resampling may be required.
Method Blank	One per preparatory batch	< QL	The cause for the out-of-spec condition should be determined and corrective action taken, if possible. Reanalyze the method blank once. If the acceptance criteria are met, all sample results are valid. Upon reanalysis, if the acceptance criteria are still not met, all samples associated with the batch should be reanalyzed.
Field Blank	Field collected – one per sampling event or one per 20 samples or one per matrix (for less than 20 samples)	< QL	Investigate problem and document and observations.
MS/MSD	One per preparatory batch	Recovery within laboratory control limits	Identify problem, then reanalyze MS/MSD
LCS	One per preparatory batch	Recovery within laboratory control limits	Identify problem, then reanalyze LCS and all associated batch samples
Field Duplicate Analysis	Field collected – one for each 20 samples or one per matrix (for less than 20 samples); will not be identified to the laboratory	50% RPD for water; for results that are less than or equal to 5-times the QL, the criterion of plus or minus two-times the QL will be applied to evaluate field duplicates	No corrective action required of the laboratory since the laboratory will not know the identify of field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.

Acronyms:
LCS = laboratory control sample
MS/MSD = matrix spike/matrix spike duplicate

QAPP Table 3-14B – Analytical Instrument Calibration for General Chemistry for MNA Parameters

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA
Spectrophotometer (Nitrate as N, Nitrite as N, Nitrate Nitrite as N, Ferrous Iron, Phosphorus)	ICAL	Daily prior to sample analysis	$r^2 \geq 0.995$	Recalibrate	Assigned Laboratory Personnel
	ICV	Once after each ICAL, prior to sample analysis	Nitrate as N, Nitrite as N, Nitrate Nitrite as N, Phosphorus: Within ± 10% of expected value Ferrous Iron: Within ± 5% of expected value	Recalibrate	
	CCV	After every 10 samples and at the end of the analysis sequence	Within ± 10% of expected value	Recalibrate, rerun all samples previous to failed CCV	
Autoanalyzer (Total Kjeldahl Nitrogen)	ICAL	Daily prior to sample analysis	$r^2 \geq 0.995$	Recalibrate	Assigned Laboratory Personnel
	ICV	Once after each ICAL, prior to sample analysis	Within ± 10% of expected value	Recalibrate	
	CCV	After every 10 samples and at the end of the analysis sequence	Within ± 10% of expected value	Recalibrate, rerun all samples previous to failed CCV	
Ion Chromatography (Sulfate, Chloride)	ICAL	Weekly prior to sample analysis	$r^2 \geq 0.990$	Recalibrate	Assigned Laboratory Personnel
	ICV	Once after each ICAL, prior to sample analysis	Within ± 10% of expected value	Recalibrate	
	CV	After every 10 samples and at the end of the analysis sequence	Within ± 10% of expected value	Recalibrate, rerun 10 samples previous to failed CCV	
Multiparameter System (Alkalinity)	ICAL	Daily prior to sample analysis	$r^2 \geq 0.995$	Recalibrate	Assigned Laboratory Personnel
	ICV	Once after each ICAL, prior to sample analysis	Within ± 10% of expected value	Recalibrate	
	CCV	After every 10 samples and at the end of the analysis sequence	Within ± 10% of expected value	Recalibrate, rerun all samples previous to failed CCV	

Acronyms:
CCV = continuing calibration verification
ICAL = initial calibration
ICV = initial calibration verification

Table 3-15 – Methane Quality Control Requirements and Corrective Actions

Matrix	**Water**		
Analytical Group	**Methane**		
Analytical Method	**RSK-175**		
Audit	**Frequency**	**Control Limits**	**Corrective Action**
Holding Times	Samples must be extracted and analyzed within holding time.	See Table 1.	If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the QAO since resampling may be required.
ICAL	Prior to sample analysis	%RSD ≤ 20% or r^2 > 0.99	If the acceptance criteria specified for initial calibration is not met, the instrument is examined for a cause and a new set of calibration standards are analyzed.
ICV	Following the ICAL	Response ± 15%	If the instrument response for ICV standard is outside the acceptance window of 85 – 115%, the analyst will not analyze samples until either the reason is determined and the problem is corrected, or a new multi-point calibration is analyzed and an acceptable ICV is run using that calibration.
CCV	CCV is analyzed at the beginning and end of each analytical shift and after every 10 field samples	Response ± 15%	If the criteria aren't met, all samples since the last CCV and before the next compliant CCV must be reanalyzed. If the standard following a sample is outside of the criteria but exhibits increasing response, the samples do not have to be reanalyzed if the target analytes are not detected.
Method Blank	One per preparatory batch	< QL	The cause for the out-of-spec condition should be determined and corrective action taken, if possible. Reanalyze the method blank once. If the acceptance criteria are met, all sample results are valid. Upon reanalysis, if the acceptance criteria are still not met, all samples associated with the batch should be reanalyzed.
Field Blank	Field collected – one per sampling event or one per 20 samples or one per matrix (for less than 20 samples)	< QL	Investigate problem and document and observations.
LCS	One per preparatory batch	Recovery within laboratory control limits	Identify problem, then reanalyze LCS and all associated batch samples
MS/MSD	One per preparatory batch	Recovery within laboratory control limits	Identify problem, then reanalyze MS/MSD

Matrix	**Water**		
Analytical Group	**Methane**		
Analytical Method	**RSK-175**		
Audit	**Frequency**	**Control Limits**	**Corrective Action**
Surrogate	Added to all field samples and laboratory QC samples	Recovery within laboratory control limits	Reanalyze any field or QC samples with surrogates that exceed control limits.
Field Duplicate Analysis	Field collected – one for each 20 samples or one per matrix (for less than 20 samples); will not be identified to the laboratory	50% RPD for water; for results that are less than or equal to 5-times the QL, the criterion of plus or minus two-times the QL will be applied to evaluate field duplicates	No corrective action required of the laboratory since the laboratory will not know the identify of field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.

Acronyms:
CCV = continuing calibration verification
ICAL = initial calibration
ICV = initial calibration verification
LCS = laboratory control sample
MS/MSD = matrix spike/matrix spike duplicate