

Naval Facilities Engineering Systems Command
Norfolk, Virginia

Final

**2020 Operable Unit 2 Groundwater Investigation
Data Summary Report
VPB180 and Monitoring Wells TT-MW180D,
TT-MW180D1, and TT-MW180D2**

Naval Weapons Industrial Reserve Plant
Bethpage, New York

June 2021

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FINAL

**2020 OPERABLE UNIT 2 GROUNDWATER INVESTIGATION
DATA SUMMARY REPORT
VPB180 AND MONITORING WELLS TT-MW180D,
TT-MW180D1, AND TT-MW180D2**

**NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

Submitted to:

**Department of the Navy
Naval Facilities Engineering Systems Command
9324 Virginia Avenue
Norfolk, VA 23511-3095**

Submitted by:

**Tetra Tech
5700 Lake Wright Drive, Suite 102
Norfolk, Virginia 23502**

**CONTRACT NUMBER N62470D9008
CONTRACT TASK ORDER WE13**

JUNE 2021

PREPARED UNDER THE DIRECTION OF:



**ERNIE WU
PROJECT MANAGER
TETRA TECH
NORFOLK, VIRGINIA**

APPROVED FOR SUBMISSION BY:



**STEVEN H. RUFFING, P.E.
PROGRAM MANAGER
TETRA TECH
NORFOLK, VIRGINIA**

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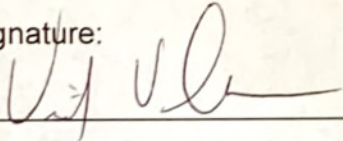
NEW YORK PROFESSIONAL GEOLOGIST SEAL

As a New York-licensed Professional Geologist, I have reviewed and approved the geological information and drawings in the 2020 Operable Unit 2 Groundwater Investigation Data Summary Report VPB180 and Monitoring Wells TT-MW180D, TT-MW180D1, and TT-MW180D2, Naval Weapons Industrial Reserve Plant, Bethpage and seal it in accordance with Article 145 Section 7209 of the New York State Education Laws. In sealing this document, I certify that the geological information contained in it is true to the best of my knowledge and the geological methods and procedures included herein are consistent with currently accepted geological practices.

It is a violation of this law for any person to alter the contained drawings in anyway, unless he or she is acting under the direction of a NY-licensed Professional Geologist.

Name: Vincent J. Varricchio
NY PG License Number: 000095
State: New York

Signature:



Date:

6/7/2021



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Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
CAMP	Community Air Monitoring Program
CLEAN	Comprehensive Long-term Environmental Action Navy
COR	Continuously Operating Reference
DoD	Department of Defense
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency, United States
ft	feet
GOCO	Government-Owned Contractor-Operated
GPS	Global Positioning System
IDW	Investigation Derived Waste
IR	Installation Restoration
MW	Monitoring Well
NAD	North American Datum
NAVD	North American Vertical Datum
NAVFAC	Naval Facilities Engineering Systems Command
NG	Northrop Grumman
NGS	National Geodetic Survey
NTU	Nephelometric Turbidity Units
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PID	Photoionization Detector
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment

PVC	Polyvinyl Chloride
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SVOC	Semivolatile Organic Compounds
TCE	Trichloroethene
UFP	United Federal Programs
VOC	Volatile Organic Compounds
VPB	Vertical Profile Boring

1.0 Introduction

Tetra Tech has prepared this Data Summary Report for the Naval Facilities Engineering Systems Command (NAVFAC) Atlantic Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N6247016D9008 Task Order WE13, which is part of the Navy's ongoing Environmental Restoration Program for the Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage Operable Unit (OU) 2 Site 1 plume identified in the 2003 Record of Decision (ROD) (NAVFAC, 2003). This report describes vertical profile boring (VPB) and monitoring well (MW) installation activities (specifically at the VPB180 location) in 2020. As shown in Figure 1, NWIRP Bethpage is located in east-central Nassau County, Long Island, New York, approximately 30 miles east of New York City.

1.1 Scope and Objectives

This data summary report provides information on the installation of VPB180 and three associated monitoring wells (TT-MW180D, TT-MW180D1, and TT-MW180D2). The purpose of the investigation was to address data gaps in the OU2 plume by better defining the horizontal and vertical extent of groundwater contamination, evaluation of migration, and determining concentrations of volatile organic compounds (VOCs) in groundwater. The contamination is up-gradient of several potable water supply wells in the area and continues to migrate to the south-southeast. VPB and MW locations are shown in Figure 2. VPB180 was completed to 963 feet (ft) below ground surface (bgs).

Field tasks were conducted in 2020 in accordance with the United Federal Programs (UFP) Sampling and Analysis Plan (SAP) Tier II Sampling and Analysis Plan, (Field Sampling and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Installation Program (Tetra Tech, 2019) and Letter Work Plan, VPB and MW Installation Program, VPB-178, -179, -180, and -181 (Tetra Tech, 2020). The field investigation included completing three vertical profile borings and seven monitoring wells, groundwater sampling, geophysical logging and surveying.

Documentation of these activities is included in the appendices of this report. Appendix A contains the summary packet for VPB180 and Appendix B for the associated wells TT-MW180D and TT-MW180D1, and TT-MW180D2. Appendix C contains the survey report.

1.2 Site History

NWIRP Bethpage is in the Hamlet of Bethpage, Town of Oyster Bay, New York. Since its inception in 1941, the plant's primary mission was the research, prototyping, testing, design, engineering, fabrication, and primary assembly of military aircraft. The facilities at NWIRP included four plants used for assembly and prototype testing, a group of quality control laboratories, two warehouse complexes (north and south), a salvage storage area, water recharge basins, the Industrial Wastewater Treatment Plant, and several smaller support buildings.

The Navy's property originally totaled 109.5 acres and was formerly a Government-Owned Contractor-Operated (GOCO) facility that was operated by Northrop Grumman (NG) until September 1998. Prior to 2002, the NWIRP property was bordered on the north, west, and south by current or former NG facilities, and on the east by a residential neighborhood. By March 2008, approximately 100 acres of NWIRP property were transferred to Nassau County in three separate actions. The remaining 9 acres and access easements were retained by the Navy to continue remedial efforts at Installation Restoration (IR) Site 1 – Former Drum Marshalling Area and Site 4 – Former Underground Storage Tanks (Area of Concern [AOC] 22). A parcel of land connecting the two sites was also retained. Currently, the 9-acre parcel of NWIRP is bordered on the east by a residential neighborhood and on the north, south, and west by Steel Equities; however, a small portion near Sites 2 and 3 is still owned by Nassau County. Access to the NWIRP is from South Oyster Bay Road.

1.3 Geology and Hydrogeology

1.3.1 Stratigraphy

Overburden at the site consists of approximately 1,100 ft of unconsolidated deposits overlying crystalline bedrock of the Hartland Formation. Overburden is divided into four geologic units in descending order: the Upper Glacial Formation, the Magothy Formation, the clay member of the Raritan Formation ("Raritan Clay") and the Lloyd Sand member of the Raritan Formation ("Lloyd Sand") (Geraghty and Miller, 1994). The crystalline bedrock consists primarily of metamorphic and igneous rocks.

The Upper Glacial Formation consists of till and outwash deposits of medium to coarse sand and gravel with lenses of fine sand, silt and clay (Smolensky and Feldman, 1988); these deposits form the Upper Glacial Aquifer. Directly underlying this unit is the Magothy Formation with a thickness of 650 to 900 ft that extends to a depth of 700 to 1,000 ft bgs, as observed at the former NWIRP and extending southeast to areas south of Southern State Parkway. Locally at VPB180, the bottom of the Magothy (top of the

Raritan Clay) is encountered at approximately 913 feet bgs. The Magothy is characterized by fine to medium sands and silts interbedded with zones of clays, silty sands and sandy clays. Sand and gravel lenses are found in some areas between depths of 550 and 820 ft bgs; these deposits form the main groundwater producing zones of the Magothy Aquifer.

Investigations performed by the Navy since 2012 indicate that the bottom of the Magothy (top of the Raritan Clay) can extend to depths of 700 to greater than 1,000 ft bgs. The top of the Raritan Clay deepens to the south-southeast, as evidenced by clay depths of 1,000 ft bgs (or more) in borings installed offsite. The Raritan Clay Unit is of continental origin and consists of clay, silty clay, clayey silt, and fine silty sand. This member acts as a confining layer over the Lloyd Sand Unit. The Lloyd Sand Unit is also of continental origin, having been deposited in a large fresh water lacustrine environment. The material consists of fine to coarse-grained sands, gravel, inter-bedded clay, and silty sand. These deposits form the Lloyd Aquifer.

1.3.2 Hydrogeology

The Upper Glacial Aquifer and the Magothy Aquifer comprise the aquifers of interest at the NWIRP. Regionally, these formations are generally considered to form a common, interconnected aquifer as the coarse nature of each unit near their contact and the lack of any regionally confining clay unit allows for the unrestricted flow of groundwater between the formations.

The Magothy Aquifer is the major source of public water in Nassau County. The most productive water bearing zones are the discontinuous lenses of sand and gravel that occur within the siltier matrix. The major water-bearing zones are coarse sand and gravel lenses located in the lower portion of the Magothy. Because of the presence of intermittent clay layers and the depths, the Magothy Aquifer is commonly regarded to function overall as an unconfined aquifer at shallow depths and a confined aquifer at greater depths. The drilling program at the NWIRP has revealed that clay zones beneath the facility are common but laterally discontinuous. No confining clay units of facility-wide extent have been encountered.

Groundwater is encountered at an average depth of approximately 50 ft bgs at the facility. Historically, because of pumping and recharge at the facility, groundwater depths have been measured to range from 15 to 60 ft bgs. The groundwater flow in the area is to the south- southeast.

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2.0 Field Program

Field investigation activities at VPB180 consisted of drilling, groundwater and soil sampling, groundwater analysis, geophysical logging, monitoring well installation, and surveying. After the VPB and geophysical logging were completed, the lithology and analytical data from the groundwater hydropunch samples were used to select the MW screen intervals at the respective location. Drilling during this investigation was performed by Delta Well and Pump Company of Ronkonkoma, New York. A description of these tasks is provided below.

2.1 Vertical Profile Borings

Vertical profile boring VPB180 was completed during this field effort between March and May 2020. The total depth of VPB180 was 963 ft. The location is shown in Figure 2 and details are summarized in Table 1.

2.1.1 Drilling

In order to prevent sloughing of the borehole through unconsolidated lithologies, the VPB was installed by setting a 10-inch diameter surface casing using a hollow stem auger drill rig. The surface casing was set to 52 ft bgs at the VPB locations. The remainder of the drilling depth was advanced using mud rotary drilling techniques. Drilling mud consisted of potable water and polymer-free sodium bentonite. Drilling mud was contained and re-circulated in baffled, high capacity mud tubs. A sand separator was used intermittently to remove fines from circulation.

2.1.2 Sampling

A total of three (3) split spoon samples were collected from VPB180. A change in geology was observed by the field geologist at 948 ft bgs and three (3) split spoon samples were subsequently collected to confirm the presence of the Raritan Clay. Samples were logged by the field geologist and screened for VOCs utilizing a photoionization detector (PID). A detailed boring log for VPB180 is included in Appendix A.

Groundwater grab samples were collected every 50 ft for the first 200 ft of borehole depth. After the first 200 ft, groundwater grab samples were collected approximately every 20 ft until the boring terminated in the Raritan Clay. Groundwater grab samples were collected with a hydropunch sampler and analyzed for VOCs using Environmental Protection Agency (EPA) Method SW846-8260B. The groundwater grab samples were analyzed by Chemtech, a Department of Defense (DoD) Environmental Laboratory

Accreditation Program (ELAP), and New York State Department of Environmental Conservation (NYSDEC)-certified laboratory. During the collection of groundwater grab samples, field parameters were measured (pH, temperature, specific conductivity, oxidation reduction potential, dissolved oxygen, and turbidity). Groundwater grab sample logs, data validation packages, and analytical data tables for VPB180 are included in Appendix A.

During drilling, air sampling was conducted under a Community Air Monitoring Plan (CAMP). At each VPB location, two air samples, upwind and downwind, were collected using Summa canisters and were submitted for laboratory analysis by EPA Method TO-15. All analyses were performed by Eurofins Air Toxics, LLC. Air sample logs, data validation packages, and analytical data tables for VPB180 are included in Appendix A. In addition to the collected air samples, dust monitoring and PID readings were collected. No exceedances which would cause drilling operations to cease, under the CAMP, were observed during the active operation of the drill rig.

Analytical results from groundwater grab and air samples received full validation. Data validation was performed by an independent, third party contractor, Validata Chemical Services, Inc. of Duluth, GA. Data validation summary reports and analytical data tables for VPB180 are included in Appendix A.

2.1.3 Geophysics

At each VPB location, borehole geophysical logs (gamma) were recorded after the borehole was drilled but prior to the removal of drill rods. A copy of the log was printed in the field for review once the probe reached the bottom of the borehole. The instrument was then raised to the top of the boring and a second log was generated and printed in the field. The down hole gamma log sheets and plots comparing the gamma log with trichloroethene (TCE), tetrachloroethene (PCE), and Freon-113 concentrations from hydropunch samples for VPB180 are included in Appendix A.

2.2 Monitoring Well Installation

Three monitoring wells were installed at the site between June 2020 and July 2020. The geophysical logs and the groundwater analytical data collected from the hydropunch sampler were used to determine the number of monitoring wells and the screened interval for each monitoring well. Depths of monitoring wells ranged from 245 ft bgs to 735 ft bgs. Locations are shown on Figure 2.

2.2.1 Drilling and Well Construction

The wells were installed using mud rotary drilling techniques. Well construction details are summarized in Table 2. The wells were installed in close proximity to the VPBs. The borings logs for VPB180 is in Appendix A and the boring logs for the respective wells are included in Appendix B.

Prior to installing each monitoring well, screen intervals were determined from the results of the groundwater samples, the geophysical logs, lithology, field data collected from the vertical profile borings, and data from nearby vertical profile borings, groundwater monitoring wells or public water supply wells. Screens were selected based on several goals: to monitor the depth interval of the highest VOC concentrations observed in the hydropunch groundwater sample data and to monitor depths of interest to the OU2 plume. During the monitoring well installation, split spoon soil samples were collected every five feet in the screen interval to confirm the presence of a higher permeability interval.

Wells were constructed of 4-inch diameter, Schedule 80, National Sanitation Foundation-approved polyvinylchloride (PVC) riser pipe and 0.010-slot well screen. Wells were completed at the surface with a 12-inch diameter steel curb box. Well risers were set below grade and fit with lockable J plugs. Details monitoring well construction diagrams for TT-MW180D, TT-MW180D1, and TT-MW180D2 are included in Appendix B.

2.2.2 Well Development

Following installation, all monitoring wells were developed to evacuate silts and other fine-grained materials and to establish the filter pack to promote a hydraulic connection between the well and the surrounding aquifer. Well development was not initiated until at least 24 hours after well installation.

Monitoring well screens were developed using a combination of air lifting and pumping with a submersible pump. The following groundwater quality parameters were collected during development to determine stabilization: pH, specific conductivity, dissolved oxygen, turbidity, temperature and oxidation-reduction potential. In compliance with NYSDEC policy, wells were developed until turbidity was less than 50 nephelometric turbidity units (NTUs) if possible. Table 3 summarizes total pumped volume from air lifting and pump development and final turbidity. Well development logs for TT-MW180D, TT-MW180D1, and TT-MW180D2 are included in Appendix B.

Groundwater samples were collected at the end of development activities using the submersible pump dedicated for development. These samples were collected to provide

initial screening level data for VOCs and 1,4-dioxane using Methods SW846-8260B and SW846-8270 SIM, respectively. This data did not receive data validation since the samples are not considered high quality samples. These monitoring wells are sampled as part of the ongoing quarterly sampling events and data from the initial sampling event is reported/documentated under separate reports. The unvalidated analytical data tables for TT-MW180D, TT-MW180D1, and TT-MW180D2 are included in Appendix B.

2.3 Decontamination and Investigation Derived Waste (IDW)

As part of the IDW management practices and in accordance with the SAP, the investigation waste (consisting of soil cuttings, drilling muds, groundwater monitoring well development water, decontamination fluids, and personal protective equipment [PPE]) generated during the boring installation was containerized and staged at NWIRP Bethpage. IDW solids were characterized and disposed of properly under requirements outlined in NYSDEC subpart 375-6.8(b) and CP-51. Representative samples of soil IDW were collected from roll off containers and submitted to Chemtech for analysis, which includes VOCs, semi-volatile organic compounds (SVOCs), Metals and polychlorinated biphenyls (PCBs)/Pesticides.

IDW fluids was containerized in frac tanks and stored at NWIRP Bethpage for characterization and ultimate disposal to the Publicly Owned Treatment Works (POTW), in accordance with the facilities existing discharge permit. A representative water sample was collected from each frac tank and submitted to Chemtech for analysis of VOCs via EPA Method 624.1, PCBs via Method 8082A and Total Metals via Method 6010. To the extent feasible, soil and water were not mixed.

All IDW generated during this investigation was characterized as non-hazardous.

2.4 Surveying

A survey of the VPB and groundwater monitoring well locations was conducted by Borbas Surveying & Mapping, LLC, of Boonton, NJ, under the direct supervision of Tetra Tech. The locations were tied into the existing base map developed for this investigation. The survey elevation is referenced to the North American Vertical Datum (NAVD) 1988 and has a vertical accuracy of 0.01 foot. Vertical control is based on observations of the National Geodetic Survey (NGS) Continuously Operating Reference (COR) Stations NYBR, NYCI, NYVH and SHK6. The horizontal location is referenced to the North American Datum (NAD) 1983 New York, Long Island State Plane Coordinate System and has an accuracy of 0.1 foot. Horizontal control is based on Global Positioning System (GPS) observations using the NGS COR Stations NYBR, NYCI, NYVH and SHK6.

A table of survey data (grade elevation, northing/easting and latitude/longitude) is included in Appendix C.

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3.0 References

Geraghty and Miller, Inc., 1994. *Remedial Investigation Report, Grumman Aerospace Corporation, Bethpage, New York*. Revised September 1994.

Naval Facilities Engineering Command (NAVFAC), 2003. *Record of Decision Naval Weapons Industrial Reserve Plant Bethpage, New York, Operable Unit 2 – Groundwater*, NYS Registry: 1-30- 003B. April.

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Tetra Tech, 2020. *Letter Work Plan, Vertical Profile Boring and Monitoring Well Installation Program VPB-178, -179, -180, and -181*. Naval Weapons Industrial Reserve Plant Bethpage, New York. May.

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TABLES

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TABLE 1
VERTICAL PROFILE BORING SUMMARY
2020 OU2 GROUNDWATER INVESTIGATION
NWIRP BETHPAGE, NY

BORING	BORING START DATE	BORING COMPLETION DATE	GROUND ELEVATION (MSL)	TOTAL DEPTH (ft bgs)	VERTICAL PROFILE BORING SUMMARY	NO. OF SPOON SAMPLES	GAMMA LOG (ft bgs)	NO. GW SAMPLES COLLECTED/ ATTEMPTED	DATE OF AIR SAMPLE	MONITORING WELLS INSTALLED AT LOCATION
VPB180	3/26/2020	5/11/2020	70.9	963	2020 OU2 GROUNDWATER INVESTIGATION	3	963	38 / 56	4/16/2020	TT-MW180D, TT-MW180D1, TT-MW180D2

MSL - mean sea level

ft bgs - feet below ground surface

TABLE 2
MONITORING WELL CONSTRUCTION SUMMARY
2020 OU2 GROUNDWATER INVESTIGATION
NWIRP BETHPAGE, NY

MONITORING WELL	ADJACENT VPB	WELL COMPLETION DATE	GROUND ELEVATION (MSL)	WELL DEPTH (ft bgs)	CASING DEPTH (ft bgs)	SCREEN INTERVAL (ft bgs)	SUMP DEPTH INTERVAL (ft bgs)	BORING DEPTH (ft bgs)
TT-MW180D	VPB180	6/17/2020	71.2	245	52	220 - 240	240 - 245	258
TT-MW180D1		6/5/2020	71.3	605	52	580 - 600	600 - 605	618
TT-MW180D2		7/8/2020	71	735	52	710 - 730	730 - 735	748

MSL - mean sea level

ft bgs - feet below ground surface

TABLE 3
MONITORING WELL DEVELOPMENT SUMMARY
2020 OU2 GROUNDWATER INVESTIGATION
NWIRP BETHPAGE, NY

MONITORING WELL	ADJACENT VPB	AIR DEVELOPMENT		PUMP DEVELOPMENT			APPROX. TOTAL DEVELOPMENT VOLUME (GAL)	FINAL TURBIDITY (NTUs)
		DATE	APPROX. VOLUME (GAL)	DATE	FINAL PUMP DEPTH (FT)	APPROX. VOLUME (GAL)		
TT-MW180D	VPB180	7/14/2020	6,800	7/20/2020	240	5,000	11,800	5.22
TT-MW180D1		7/13/2020	6,800	7/16-7/17/2020	600	10,800	17,600	45.20
TT-MW180D2		7/15/2020	2,700	7/21-7/22/2020	730	7,300	10,000	26.40

GAL - gallon

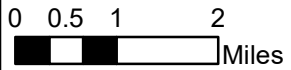
FT - feet

NTUs - Nephelometric Turbidity Units

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FIGURES

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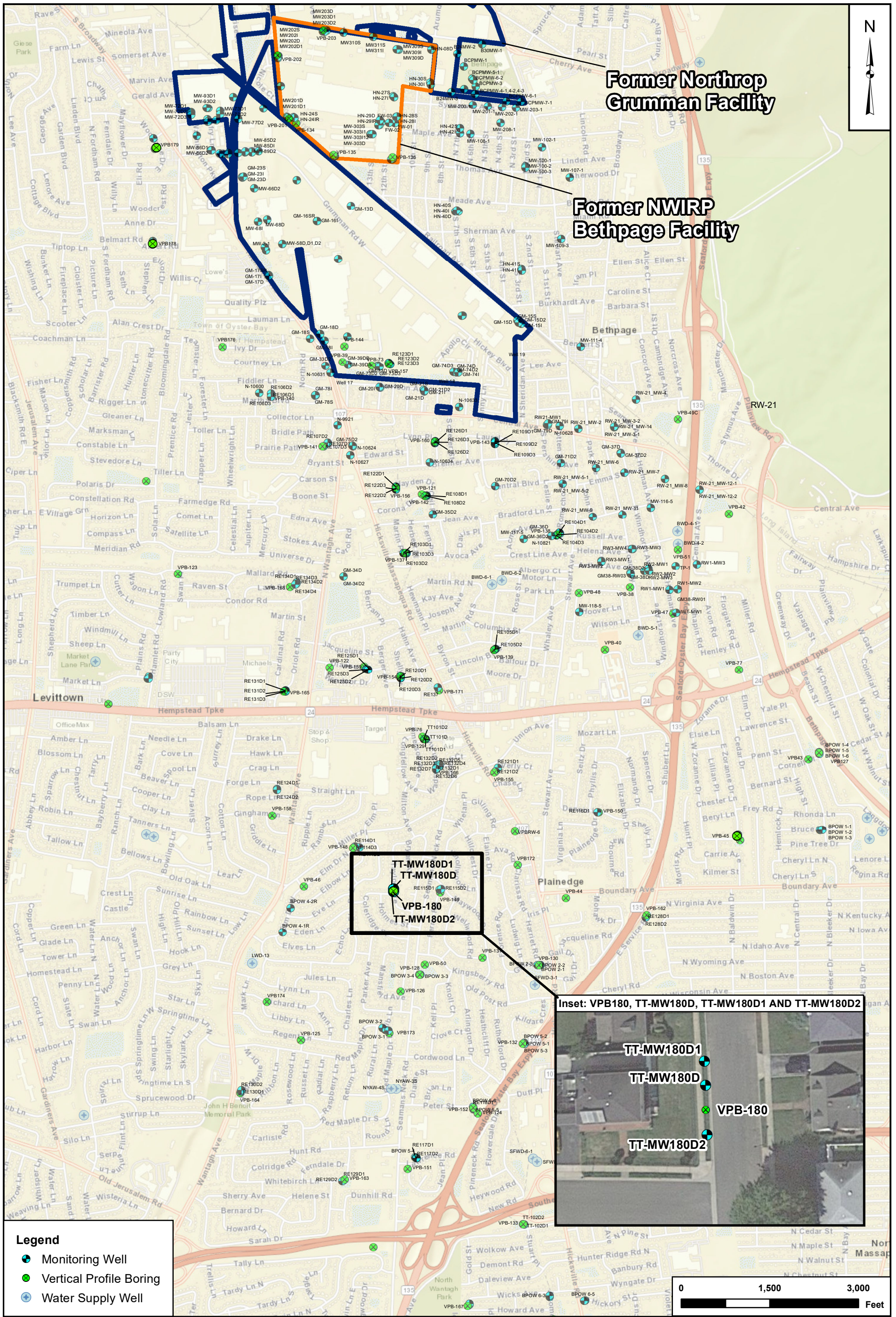
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**GENERAL LOCATION MAP
NWIRP BETHPAGE, NEW YORK**

CTO	
N62470-16-D-9008 WE13	
DRAWN BY	DATE
MC	07/27/20
CHECKED BY	DATE
EW	07/27/20
FIGURE NUMBER	
1	

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Legend

- Monitoring Well
- Vertical Profile Boring
- + Water Supply Well

VPB180, TT-MW180D, TT-MW180D1, AND TT-MW180D2 LOCATION MAP
2020 OU2 GROUNDWATER INVESTIGATION
DATA SUMMARY REPORT VPB180 AND MONITORING WELLS TT-MW180D, TT-MW180D1, AND TT-MW180D2
NWIRP BETHPAGE, NEW YORK



DRAWN BY MC	DATE 06/02/21	CTO WE13
CHECKED BY EW	DATE 06/02/21	FIGURE NUMBER 2

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APPENDICES

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APPENDIX A
VPB180

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Vertical Profile Boring 180

- 1. VPB180 Boring and Gamma Log**
- 2. VPB180 Gamma and PCE/TCE/Freon-113 Plot**
- 3. VPB180 Groundwater Sample Log Sheets**
- 4. VPB180 Groundwater Analytical Data Validation**
 - Validation Letter
 - Chain of Custody Records
 - Analytical Data Sheets
- 5. VPB180 Groundwater Analytical Data Validation Table**
- 6. VPB180 Air Sample Analytical Data Validation**
 - Validation Letter
 - Chain of Custody Records
 - Analytical Data Sheets
- 7. VPB180 Air Sample Analytical Data Validated Table**

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1. VPB180 Boring and Gamma Log

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CLIENT NAVFAC MIDLANT PROJECT NAME NWIRP Bethpage OU2
 PROJECT NUMBER 112G08005-WE13 PROJECT LOCATION BETHPAGE
 DATE STARTED 3/26/20 COMPLETED 5/11/20 TOTAL DEPTH (ft): 963 HOLE SIZE 7.625 inches
 DRILLING CONTRACTOR DELTA WELL & PUMP LOGGED BY Beau Benfield
 DRILLING METHOD MUD ROTARY
 NORTHING 200984.2 ft EASTING 1124946.4 ft GROUND ELEVATION 70.9 ft NVD 88
 NOTES hole size 12.25 from 0 to 50 HSA

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	0	62.5					
1.0				OL		(OL) Topsoil/Organic SILT, moist	69.9
5.0				SW		(SW) Yellowish brown well graded fine to coarse subrounded SAND, few fine subrounded Gravel, moist	65.9
10.0				SWGW		(SWGW) Brown well graded fine to coarse subrounded SAND and well graded fine to coarse subrounded Gravel, moist	60.9
30.0				SWGW		(SWGW) Brown well graded fine to coarse subrounded SAND and well graded fine to coarse subrounded Gravel, trace cobbles, moist	40.9
40.9				SWGW		(SWGW) Brown well graded fine to coarse subrounded SAND and well graded fine to coarse subrounded Gravel, trace cobbles, wet	20.9
50.0							

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

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CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
50	0 62.5 125					
60				SWG		(SWG) Brown well graded fine to coarse subrounded SAND and well graded fine to coarse subrounded Gravel, wet
70				GWSW		(GWSW) Yellowish brown well graded fine to coarse subrounded GRAVEL and well graded fine to coarse subrounded Sand, wet
80				SW		(SW) Reddish yellow well graded fine to coarse subangular SAND, few fine subangular Gravel, wet
90				SW		(SW) Reddish yellow well graded fine to coarse subangular SAND, trace fine subangular Gravel, wet
100				SP		(SP) Reddish yellow poorly graded fine SAND, trace lean Clay, wet

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	0 62.5 125					
110				SP		108.0 -37.1
				SPGP		(SPGP) Brown poorly graded fine to medium subangular SAND, few fine subrounded Gravel, wet 114.0 -43.1
				MLCL		(MLCL) Brown silty SAND, some lean Clay, wet 120.0 -49.1
120				SPSM		(SPSM) Brown poorly graded fine to medium subangular SAND, trace Silt, wet 130.0 -59.1
130				SPCH		(SPCH) Brown poorly graded fine to medium subangular SAND, some light tan fat Clay, wet 138.0 -67.1
140				CHSP		(CHSP) Reddish tan fat CLAY, some poorly graded fine Sand, wet 148.0 -77.1
150				CHSP		(CHSP) Reddish tan fat to lean CLAY, trace poorly graded Sand, wet 158.0 -87.1
160				SCCL		(SCCL) Orange brown Clayey fine SAND, wet

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	0 62.5 125					
168.0				SCCL		(SCCL) Orange brown Clayey fine SAND, wet (continued)
170				SCCL		(SCCL) Tan to light tan Clayey fine SAND, wet
178.0				CLSP		(CLSP) Tan to light brown lean CLAY, some poorly graded fine Sand, wet
183.0				SCGC		(SCGC) Light tan to dark gray poorly graded Clayey fine SAND, trace subangular gravel, wet
193.0				CLSP		(CLSP) Light tan to dark gray lean CLAY, little poorly graded fine Sand, wet
203.0				CLML		(CLML) Dark gray lean CLAY, little Silt, wet
208.0				SPSM		(SPSM) Pale brown poorly graded fine to medium subangular SAND, few Silt, wet
210						
220						

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	62.5	125				
230				SPSM		(SPSM) Pale brown poorly graded fine to medium subangular SAND, few Silt, wet <i>(continued)</i>
						228.0 -157.1
				SPSM		(SPSM) Pale brown poorly graded fine to medium subangular SAND, some Silt, wet
						238.0 -167.1
240				CLSP		(CLSP) Dark gray lean CLAY, some poorly graded brown fine Sand, wet
						258.0 -187.1
250				CLSP		(CLSP) Dark gray lean CLAY, some Lignite, few poorly graded fine Sand, trace Iron Nodules, wet
						268.0 -197.1
260				CLSP		(CLSP) Dark gray lean CLAY, few poorly graded light brown fine to medium subangular Sand, few Lignite, trace Iron Nodules, wet
						278.0 -207.1
270				CLSP		

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	0 62.5 125					
280				CLSP		(CLSP) Dark gray lean CLAY, few poorly graded fine Sand, wet <i>(continued)</i>
				CLSP		
						288.0 -217.1
290				CLSP		(CLSP) Dark gray lean CLAY, trace poorly graded fine Sand, wet
						298.0 -227.1
300						(SPSM) Pale brown poorly graded fine to medium subangular SAND, some Lignite, few silt, wet
				SPSM		
						323.0 -252.1
330				CLSP		(CLSP) Gray lean to fat CLAY, some poorly graded fine to medium subangular Sand, wet
						330.0 -259.1
				SPSM		(SPSM) Pale brown poorly graded fine to medium subrounded SAND, few Lignite and Silt, wet

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	0 62.5 125					
340				SPSM		(SPSM) Pale brown poorly graded fine to medium subrounded SAND, few Lignite and Silt, wet <i>(continued)</i>
350						340.0 -269.1 (SPSM) Pale brown poorly graded fine to medium subangular SAND, some gray Silt, wet
360				SPSM		
370						
380						378.0 -307.1 (CLSP) Gray lean to fat CLAY, few poorly graded fine to medium subangular Sand, wet
390				CLSP		
390				SPCL		390.0 -319.1 (SPCL) Pale brown poorly graded fine SAND, some lean Clay, wet

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	0 62.5 125					
400				SPCL		(SPCL) Pale brown poorly graded fine SAND, some lean Clay, wet (continued)
410				CLCH		
420				CLCH		
430				SPCL		
440				CLSP		
450						

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
450	0 62.5 125					
				CLSP		(CLSP) Gray lean CLAY, some Lignite, trace poorly graded fine sand, wet <i>(continued)</i>
				CLSP		(CLSP) Gray lean CLAY, few Lignite, trace poorly graded subangular coarse sand, wet
460						
				CLSP		(CLSP) Gray lean CLAY, few Lignite, wet
470						
480						
490						
				SPSM		(SPSM) Light gray poorly graded fine to medium subangular SAND, some Silt, wet
500						

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

(Continued Next Page)



Tetra Tech

BORING NUMBER VPB-180

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CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	0 62.5 125					
510				SPSM		(SPSM) Light gray poorly graded fine to medium subangular SAND, some Silt, wet <i>(continued)</i>
						513.0 -442.1
520				CLSP		(CLSP) Gray lean CLAY, some poorly graded fine to medium subangular Sand, few lignite, wet
						533.0 -462.1
530				SPSM		(SPSM) Light gray poorly graded fine to medium subrounded SAND, some Silt, wet
						538.0 -467.1
540				MLSP		(MLSP) Light to dark gray fine sandy SILT, wet
						548.0 -477.1
550				SPSM		(SPSM) Tan to light tan poorly graded subrounded fine to medium SAND, few course Sand, trace silt, wet
						558.0 -487.1
560				CHSM		(CHSM) Light gray fat CLAY, trace fine Sand, wet

(Continued Next Page)



Tetra Tech

BORING NUMBER VPB-180

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CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	62.5	125				
570				CHSM		(CHSM) Light gray fat CLAY, trace fine Sand, wet (continued)
580				SWSM		(SWSM) Light gray well graded subangular fine to coarse SAND, some Lignite, trace silt, wet
590				SW		(SW) Light gray well graded subangular fine to coarse SAND, some fine subrounded Gravel and lignite, trace silt
600				SWSM		(SWSM) Light gray well graded subangular fine to coarse Silty SAND, some fine subrounded gravel, wet
610				MLSP		(MLSP) Dark gray SILT, trace poorly graded fine to medium subangular Sand, wet
620				CHSP		(CHSP) Gray to black fat CLAY, few poorly graded fine Sand, wet

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

(Continued Next Page)



Tetra Tech

BORING NUMBER VPB-180

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CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	62.5	125				
630				CHSP		(CHSP) Gray to black fat CLAY, few poorly graded fine Sand, wet (continued)
638.0					638.0	-567.1
640				MLSP		(MLSP) Gray fine Sandy SILT, trace Lignite, wet
650						
660						
668.0					668.0	-597.1
670				SPSM		(SPSM) Gray Silty fine to medium subangular SAND, few Lignite, trace fine poorly graded subangular gravel, wet
677						

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	0 62.5 125					
680				SPSM		(SPSM) Gray Silty fine to medium subangular SAND, few Lignite, trace fine poorly graded subangular gravel, wet (continued)
690						692.0 -621.1 (CLSP) White/gray lean CLAY, few poorly graded fine Sand, trace lignite, wet
700				CLSP		
710				SWSM		708.0 -637.1 (SWSM) Pale brown well graded fine to coarse subangular SAND, some Silt, wet
720				SWGP		718.0 -647.1 (SWGP) Pale brown well graded fine to coarse subangular SAND, some fine poorly graded subangular Gravel, few white lean clay, wet
730						

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	0 62.5 125					
740				SWGP		(SWGP) Pale brown well graded fine to coarse subangular SAND, some fine poorly graded subangular Gravel, few white lean clay, wet (continued)
					748.0	-677.1
750				CLCH		(CLCH) Gray lean to fat CLAY, few fine Sand, wet
					758.0	-687.1
760				SPSM		(SPSM) Gray poorly graded fine to medium subangular SAND, some poorly graded subangular coarse Sand and silt, wet
					763.0	-692.1
				SPSM		(SPSM) Gray poorly graded fine SAND, some poorly graded subangular medium Sand, silt and lignite, wet
					768.0	-697.1
770				SC		(SC) Light gray to white poorly graded fine Sandy CLAY, few subangular medium sand, wet
					773.0	-702.1
				SWSM		(SWSM) Light gray subangular well graded fine to coarse SAND, some Lignite, wet
					783.0	-712.1
				CLCH		(CLCH) Gray lean to fat CLAY, few poorly graded fine Sand, trace lignite, wet
					790.0	-719.1
				CHSP		(CHSP) Gray fat CLAY, some fine to medium poorly graded subangular Sand, few lignite, wet

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

DEPTH (ft)	STANDARD GAMMA RAY (API)	ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	62.5	125				
798.0			CHSP			(CHSP) Gray fat CLAY, some fine to medium poorly graded subangular Sand, few lignite, wet (continued)
810.0			SWSM			(SWSM) Gray well graded fine to coarse subangular SAND, some Silt, wet
828.0			CHSP			(CHSP) Silver gray fat CLAY, few Lignite, trace poorly graded fine sand, wet
838.0			CHSP			(CHSP) Silver gray fat CLAY, some Lignite, trace poorly graded fine sand, wet
848.0			CLCH			(CLCH) Gray lean to fat CLAY, wet
850.0			CLCH			(CLCH) Gray lean to fat CLAY, few Lignite, wet

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

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CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

VPB-GAMMA LOG - GINT STD US GDT - 5/26/21 14:55 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

DEPTH (ft)	STANDARD GAMMA RAY (API)		ENVIRONMENTAL DATA (µg/L)	FORMATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
	0	62.5					
850							(CLCH) Gray lean to fat CLAY, few Lignite, wet <i>(continued)</i>
					CLCH		
						858.0	-787.1
860					MLCL		(MLCL) Gray poorly graded fine Sandy SILT, some lean Clay, wet
						863.0	-792.1
870					CLCH		(CLCH) Gray lean to fat CLAY, wet
						883.0	-812.1
880					CLSP		(CLSP) Gray to black lean to fat CLAY, trace poorly graded fine Sand, wet
						888.0	-817.1
890					CLSP		(CLSP) Gray to black lean to fat CLAY, few Lignite, trace poorly graded fine to medium sand, wet
						898.0	-827.1
900					CLSP		(CLSP) Gray lean CLAY, some poorly graded fine to medium Sand and lignite, wet
						903.0	-832.1
					SPSM		(SPSM) Gray poorly graded fine to medium subangular Silty SAND, some lignite, wet

(Continued Next Page)

DOWN



COMPANY: DELTA WELL & PUMP CO., INC.

LOCATION: NWIRP TAYLOR AVE

Well: VPB-180

Depth Driller:

Depth Logger:

Date: 05-07-20

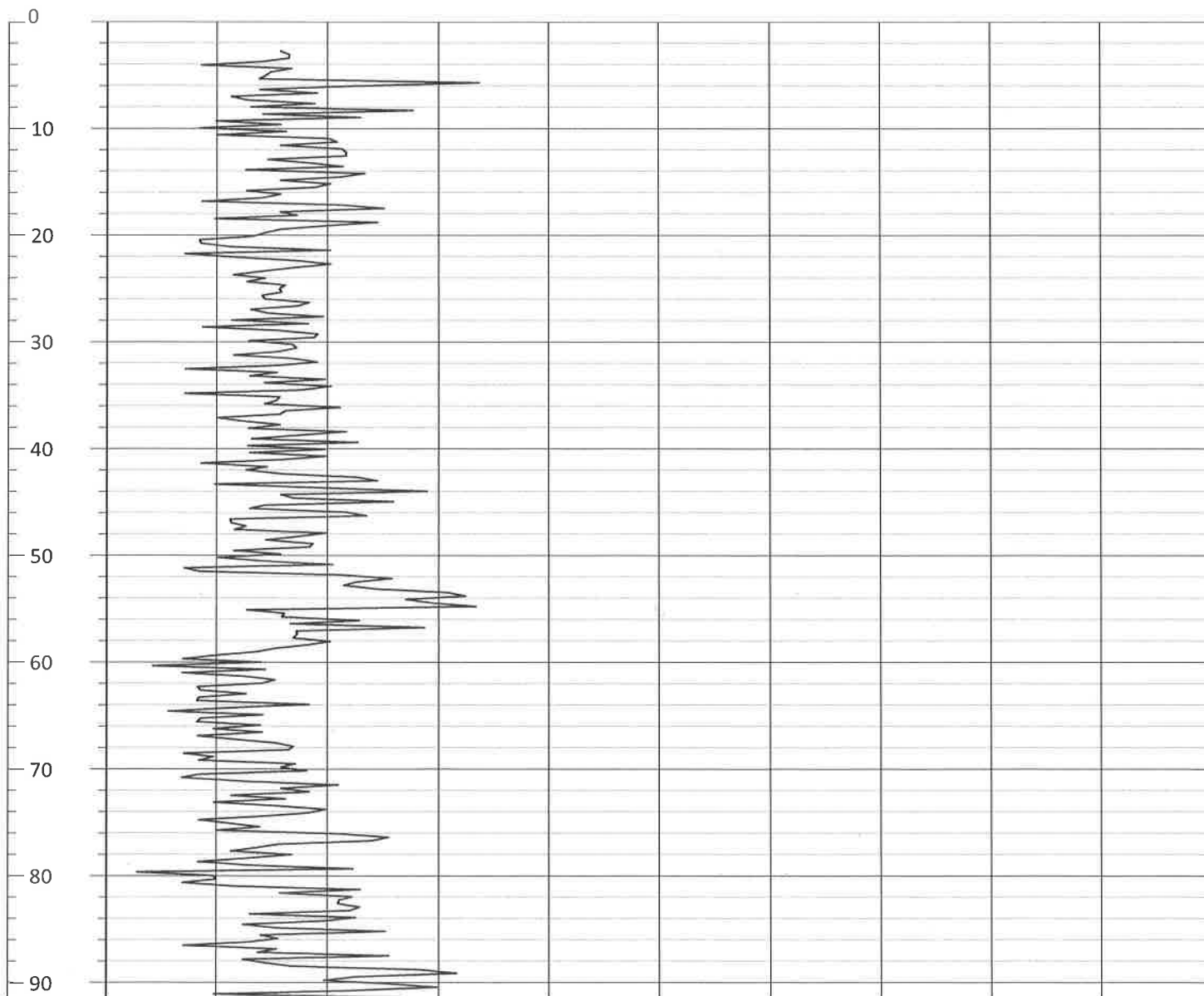
Time:

Logged by: CMO

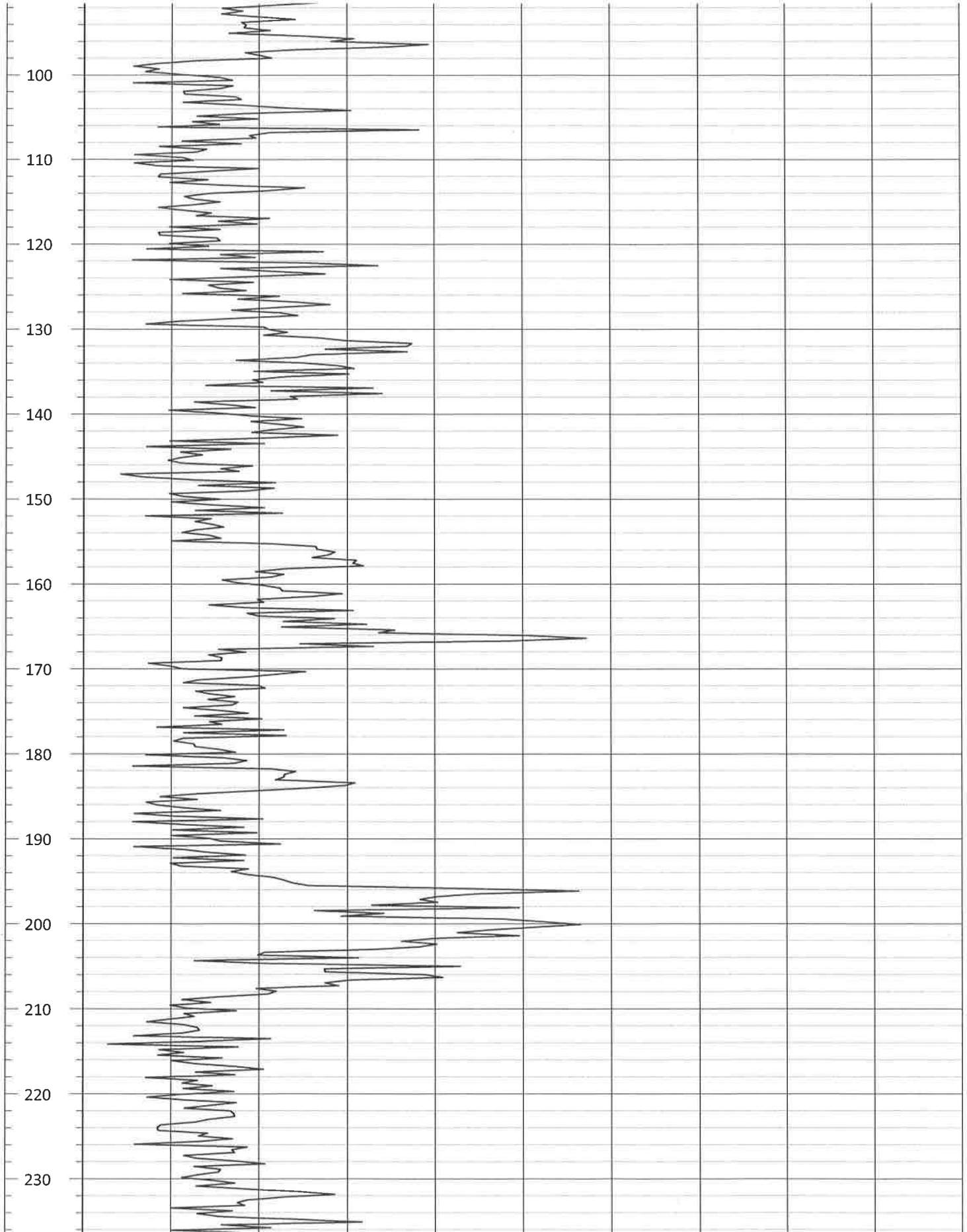
File Name: 763

Witness: BO

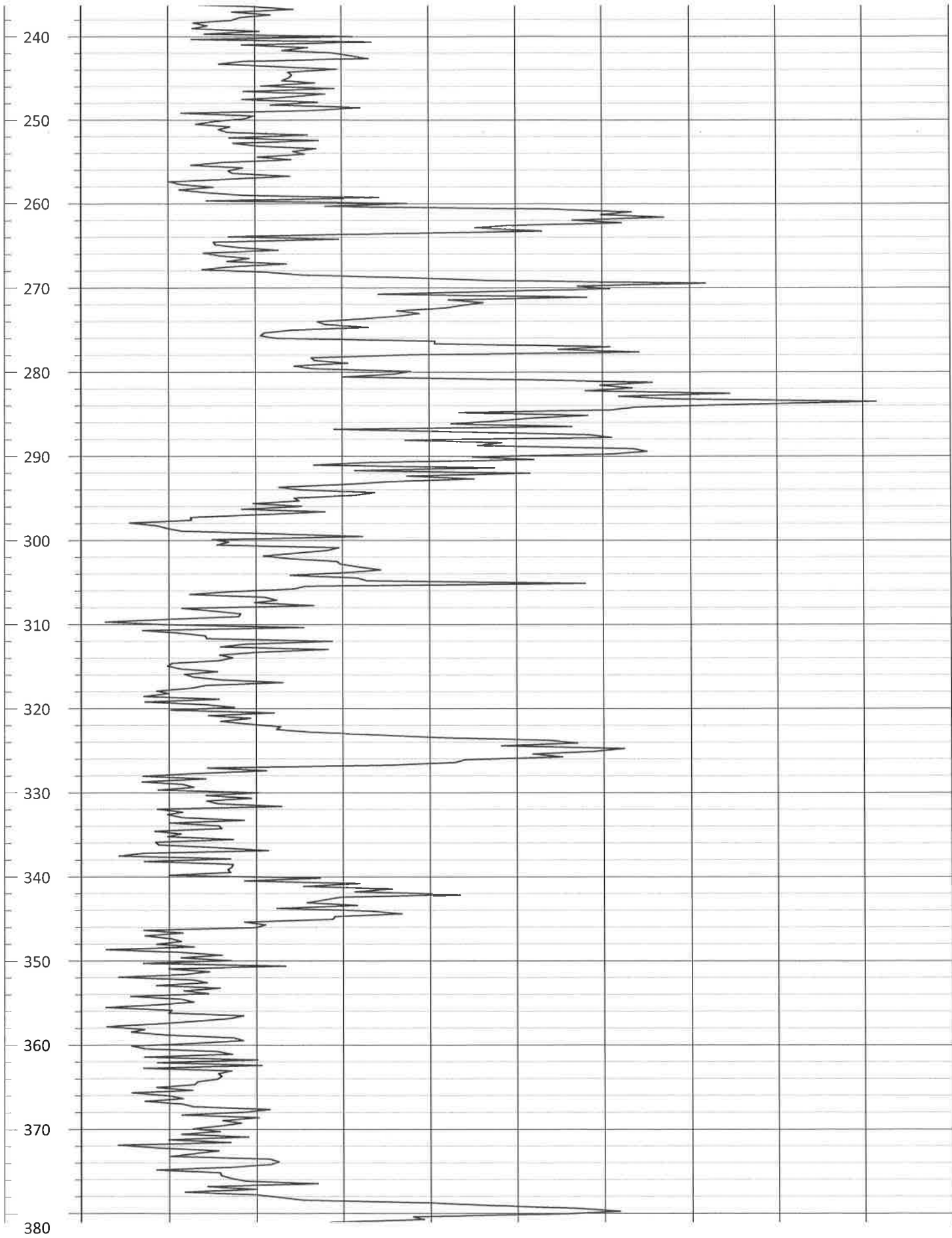
Depth (ft.)	0.0	GAMMA (cps)	100.0
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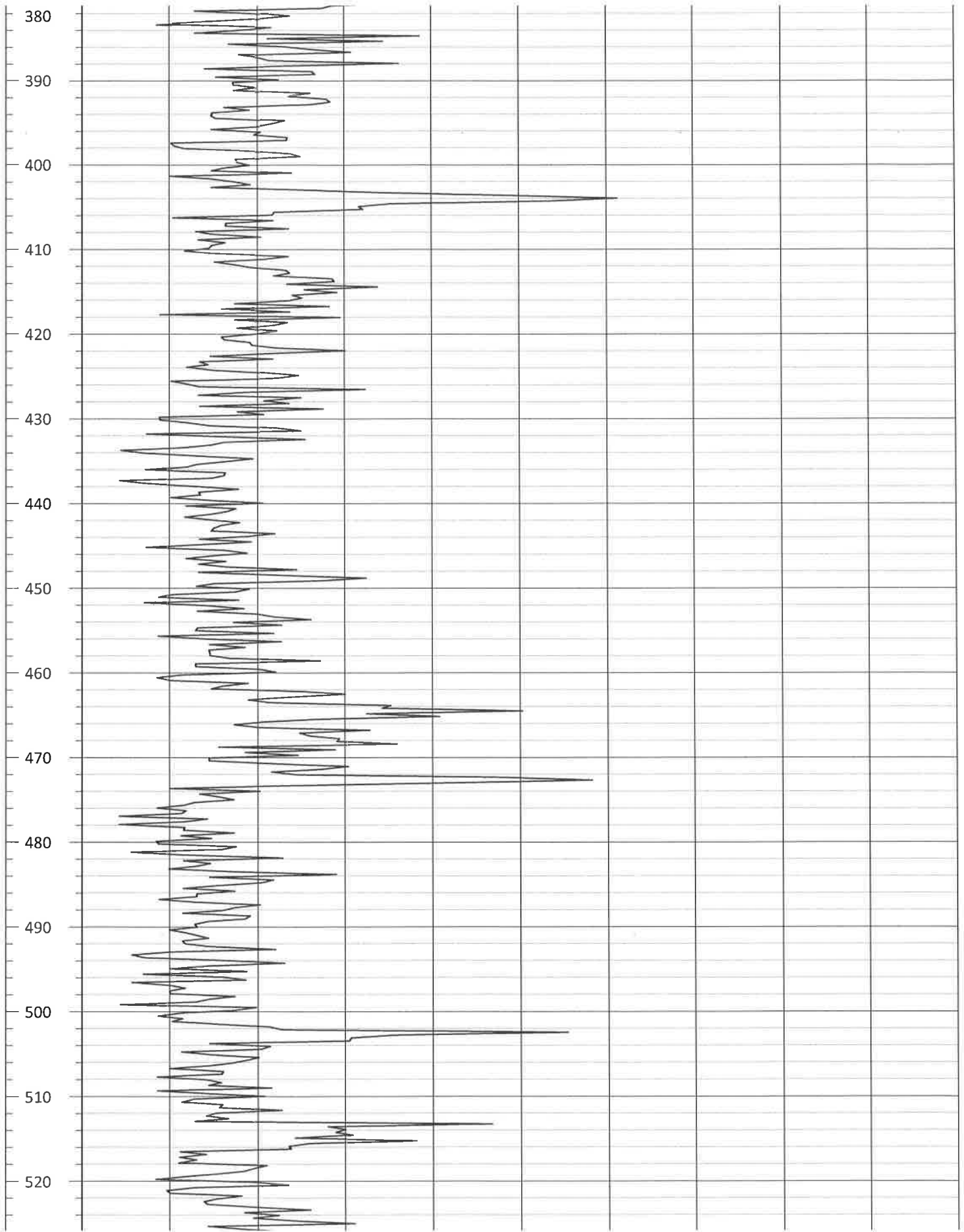
Depth (ft.)	0.0	GAMMA (cps)	100.0
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Depth (ft.)	0.0	GAMMA (cps)	100.0
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Depth (ft.)	0.0	GAMMA (cps)	100.0
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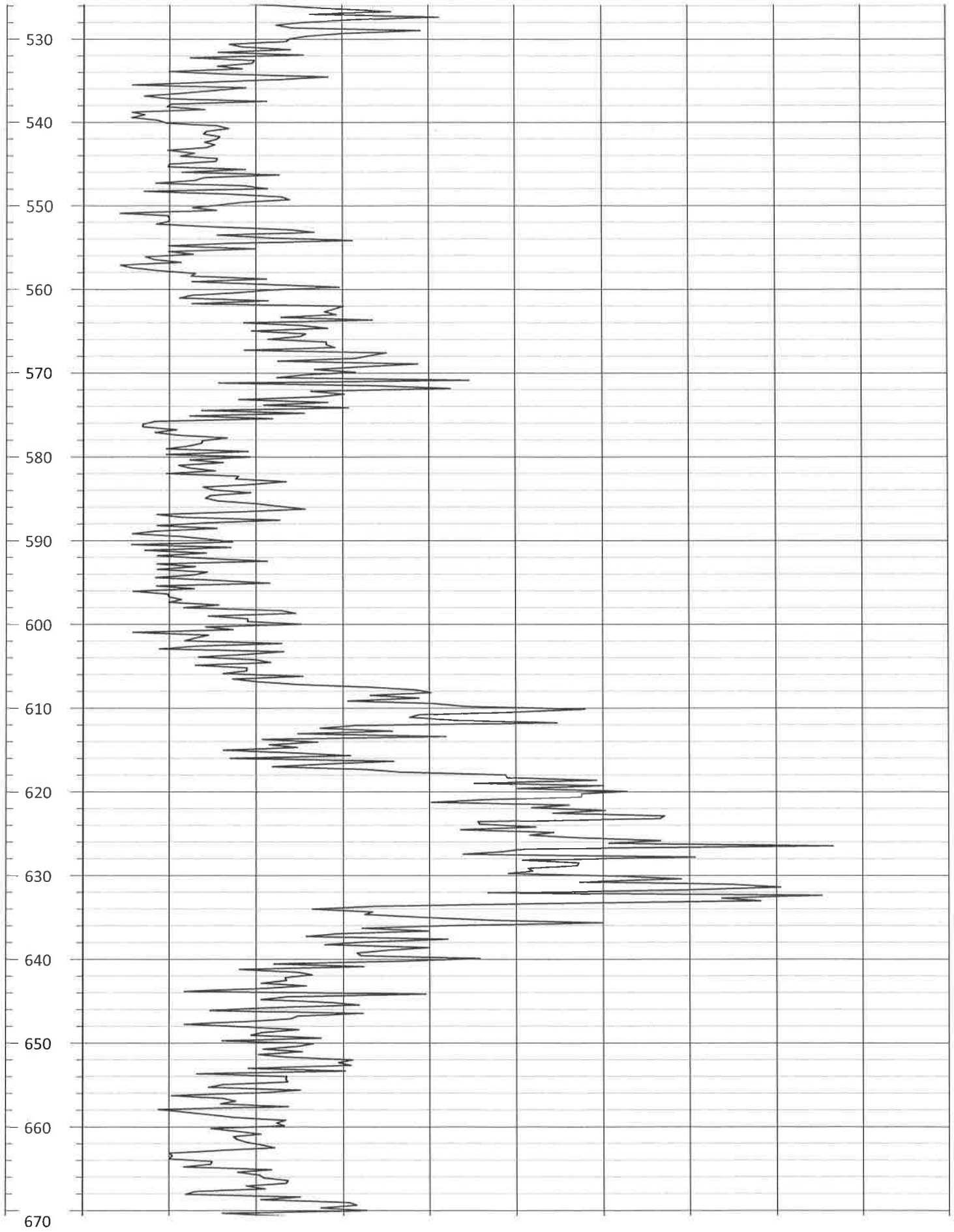


Depth (ft.)

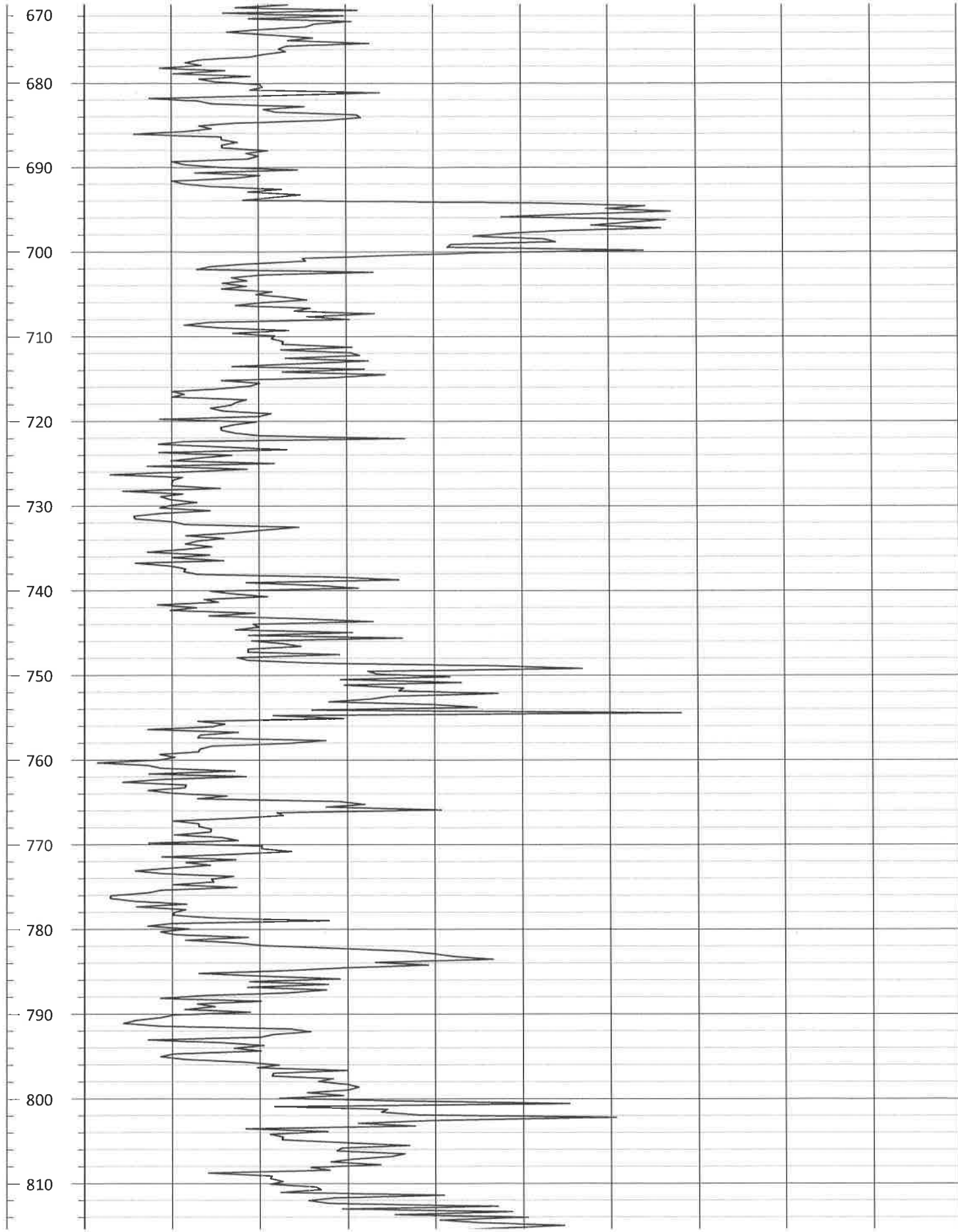
0.0

GAMMA
(cps)

100.0



Depth (ft.)	0.0	GAMMA (cps)	100.0
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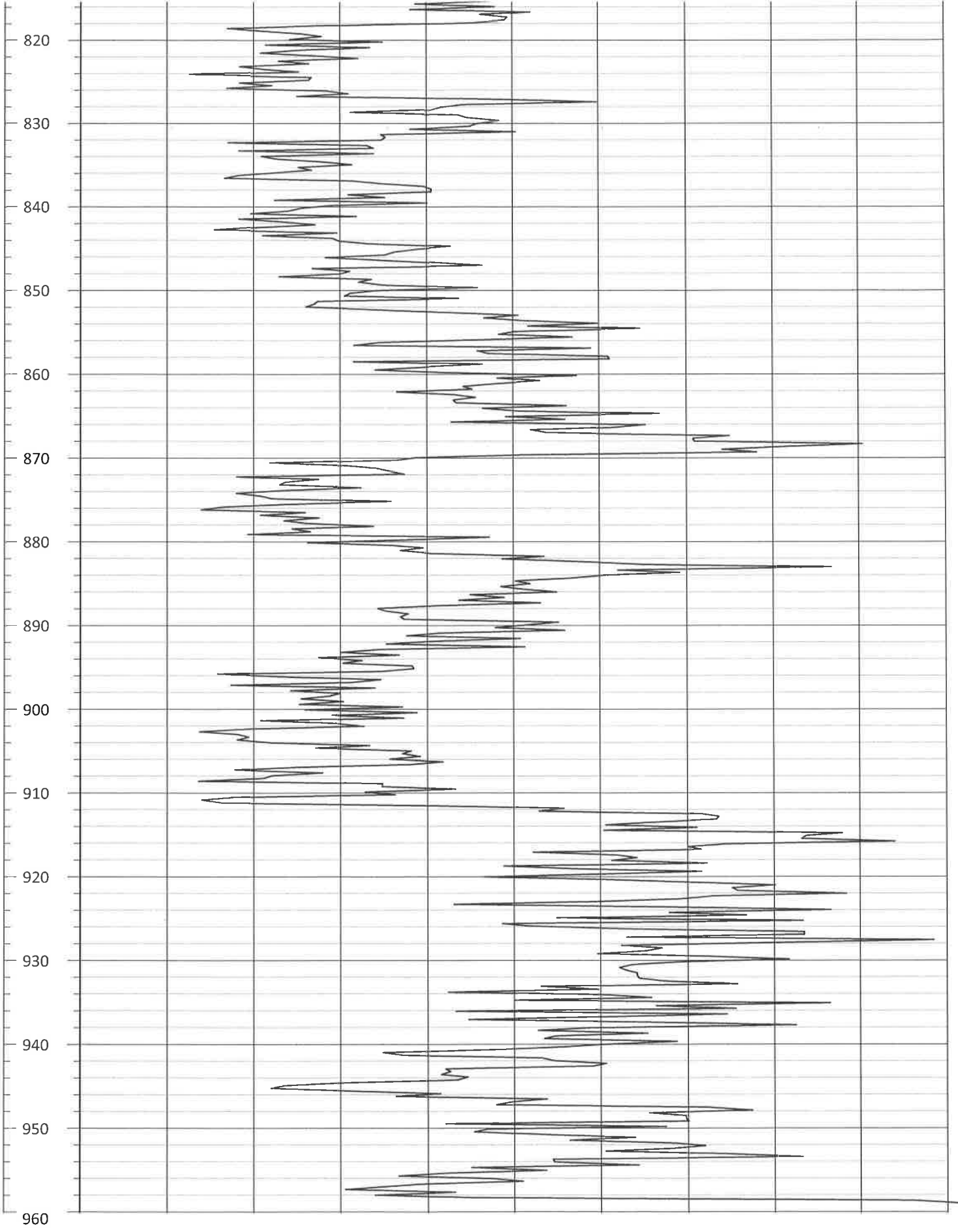


Depth (ft.)

0.0

GAMMA
(cps)

100.0



Depth (ft.)	0.0	GAMMA (cps)	100.0
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Depth (ft.)	0.0	GAMMA (cps)	100.0
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UP



COMPANY: DELTA WELL & PUMP CO., INC.

LOCATION: NWIRP TAYLOR AVE

Well: VPB-180

Depth Driller:

Depth Logger:

Date: 05-07-20

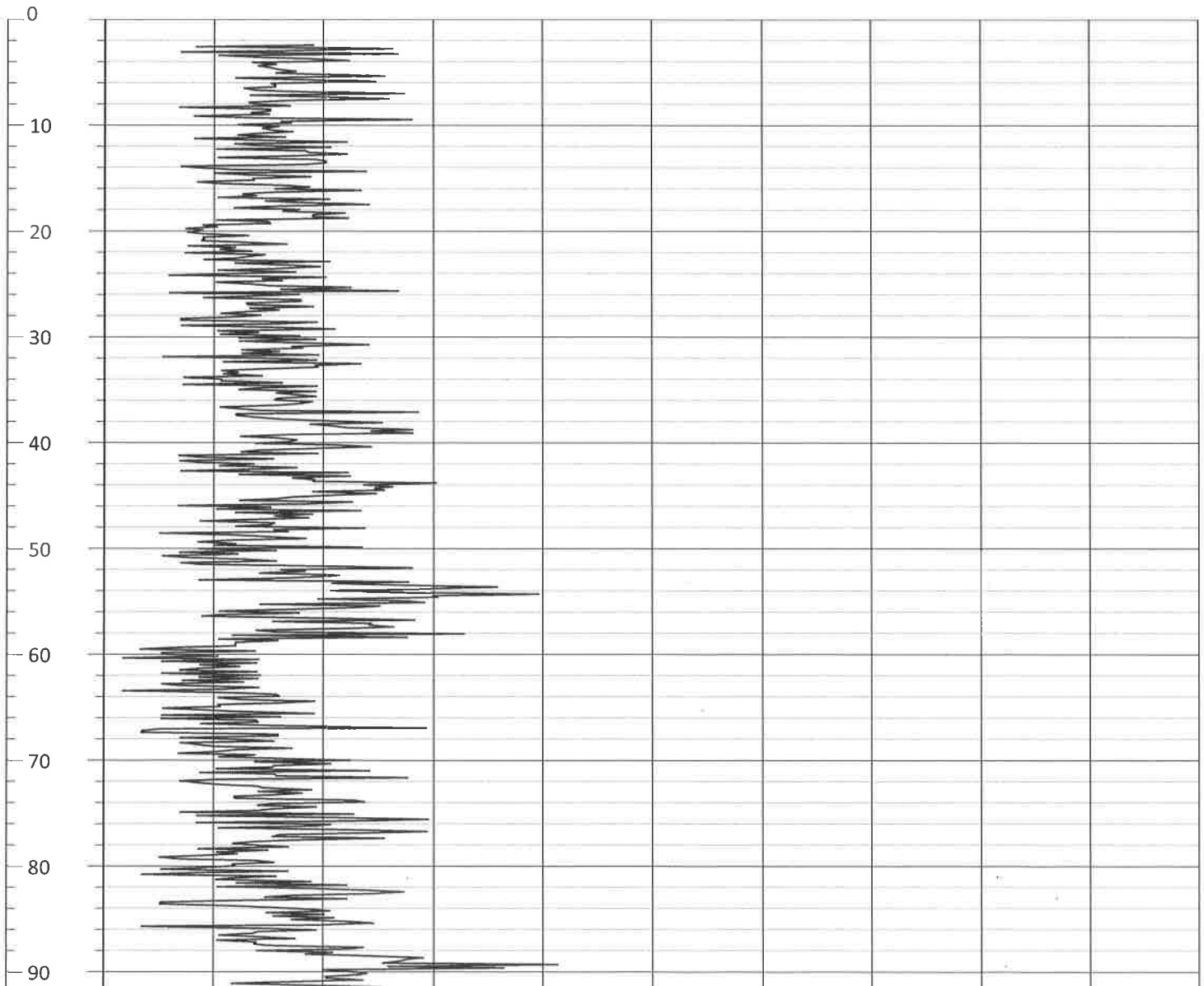
Time:

Logged by: CMO

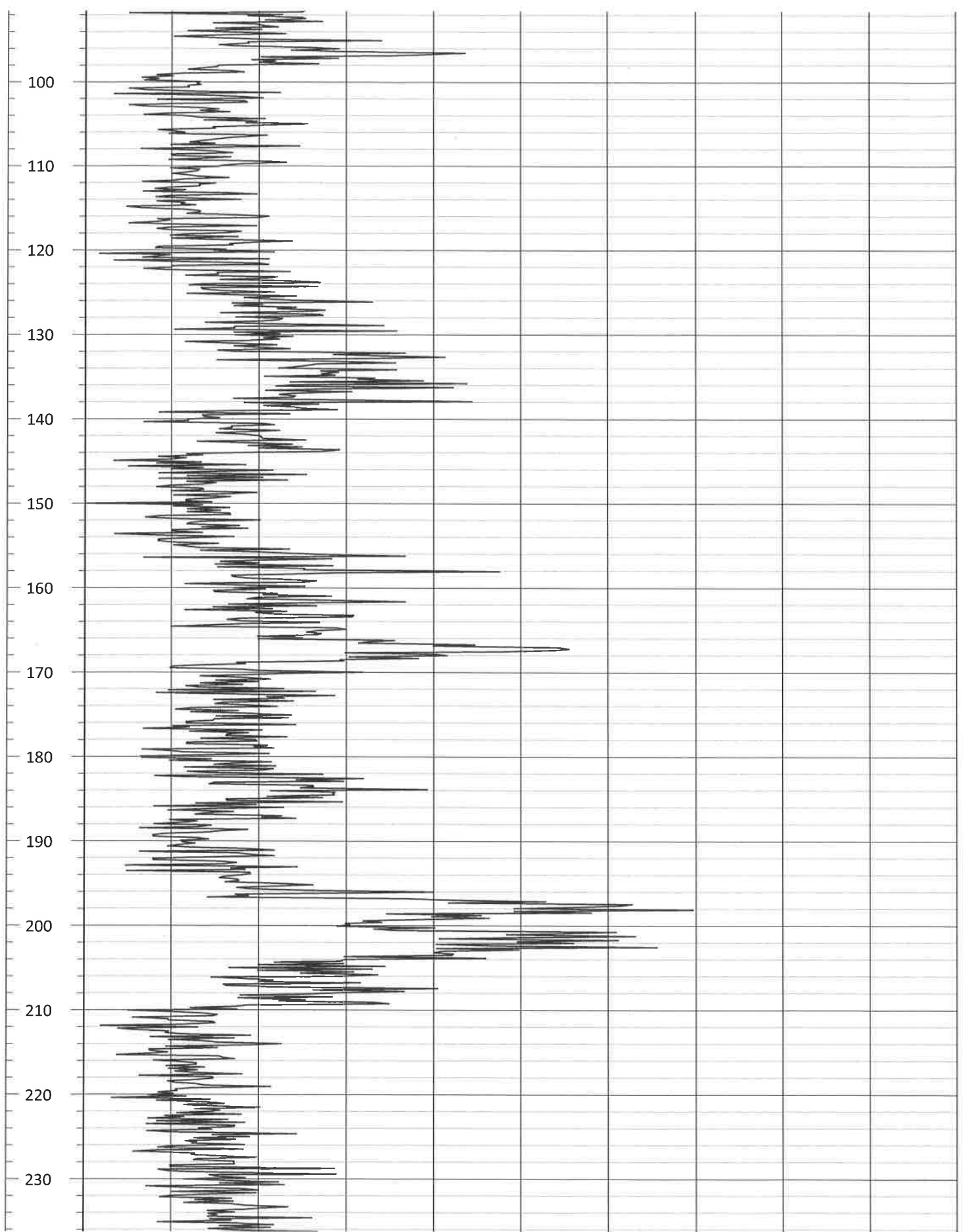
File Name: 763

Witness: BO

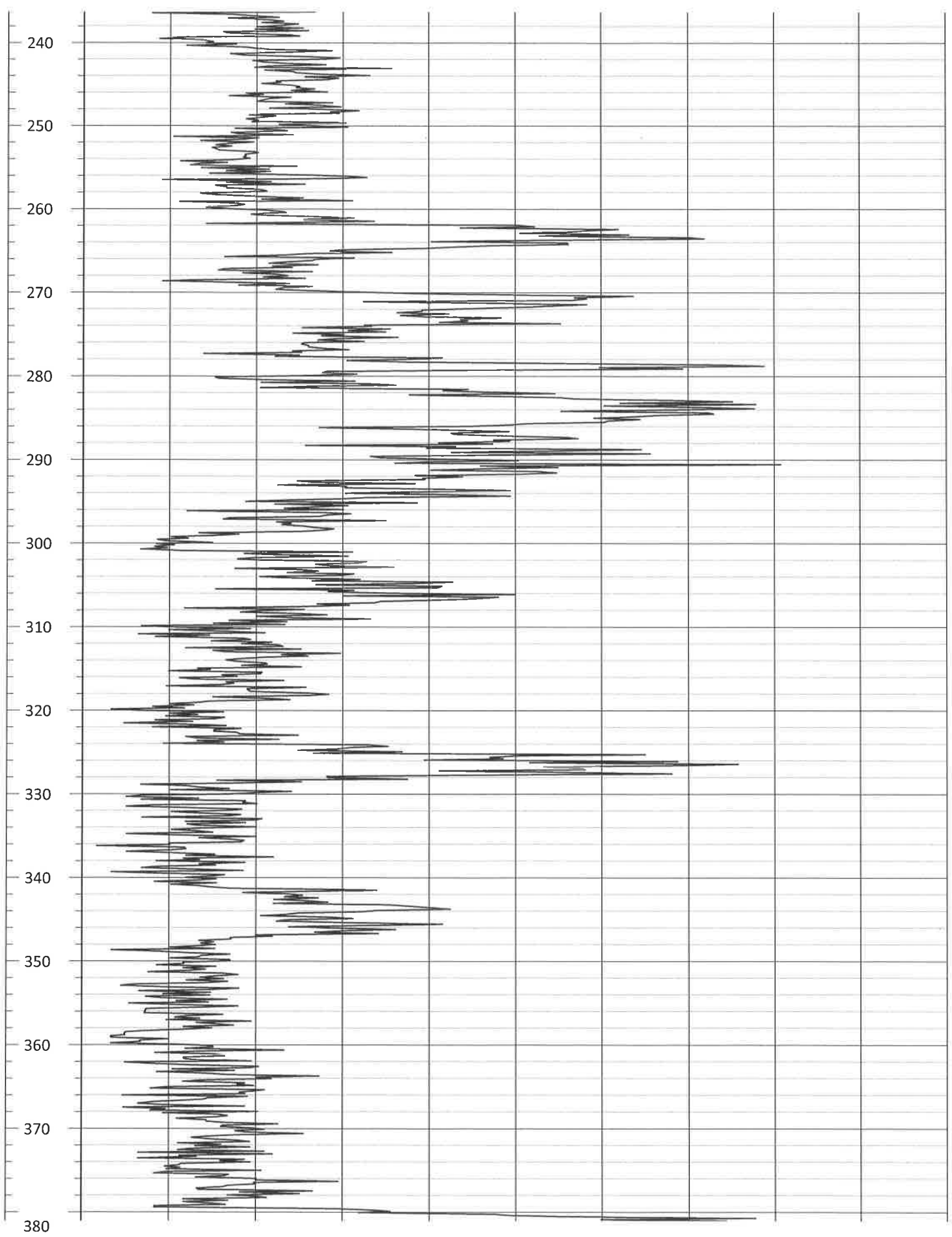
Depth (ft.)	0.0	GAMMA (cps)	100.0
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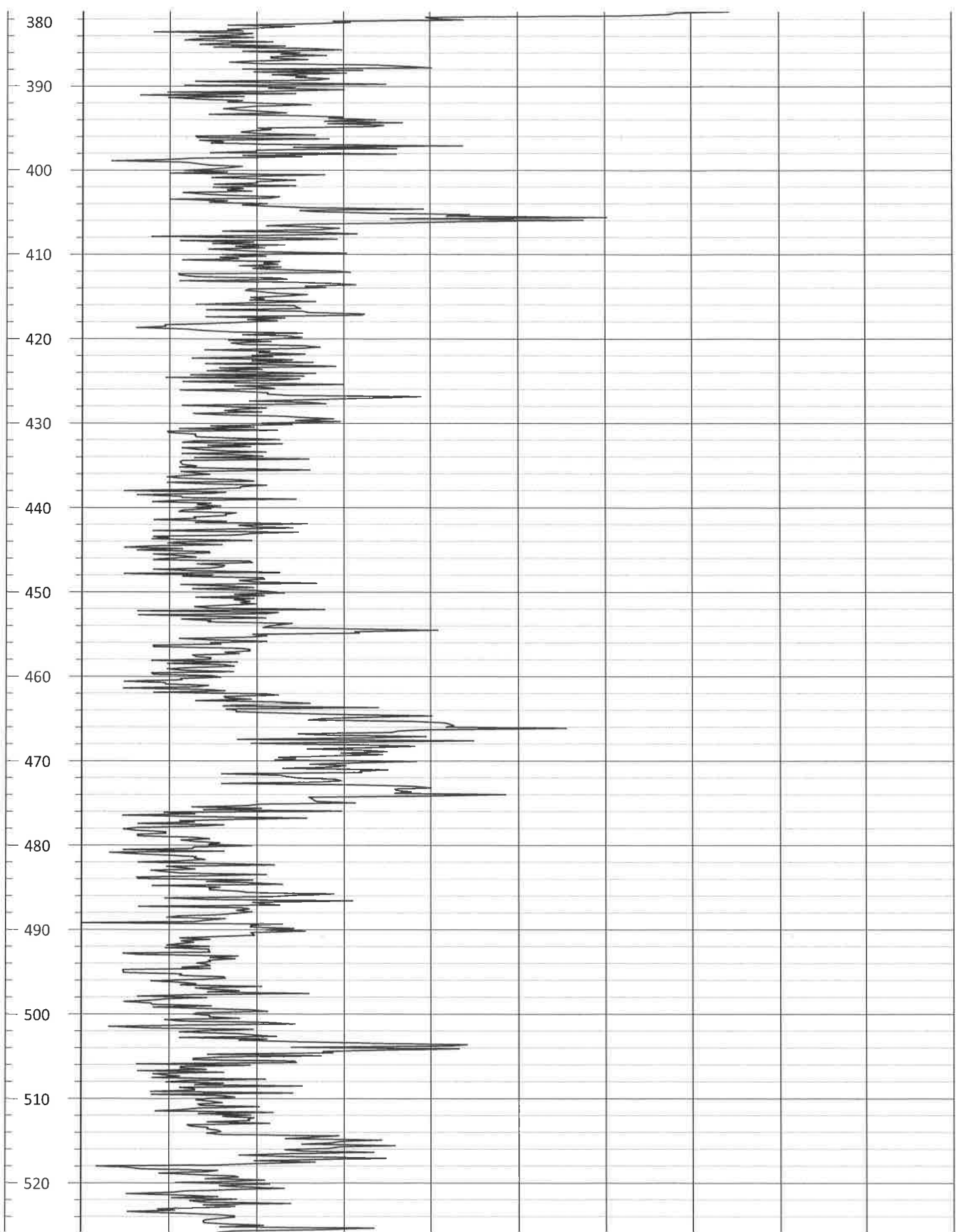
Depth (ft.)	0.0	GAMMA (cps)	100.0
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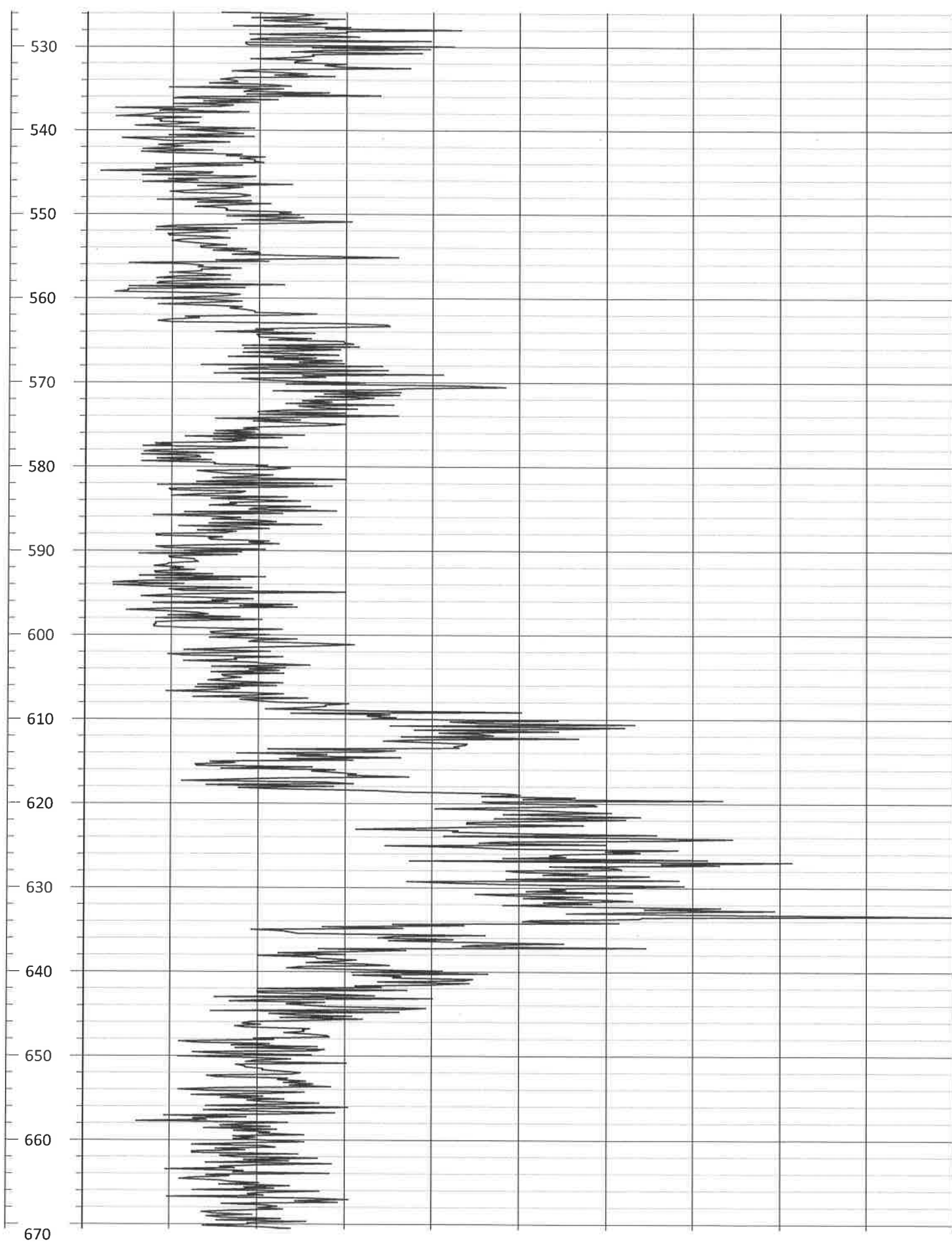
Depth (ft.)	0.0	GAMMA (cps)	100.0
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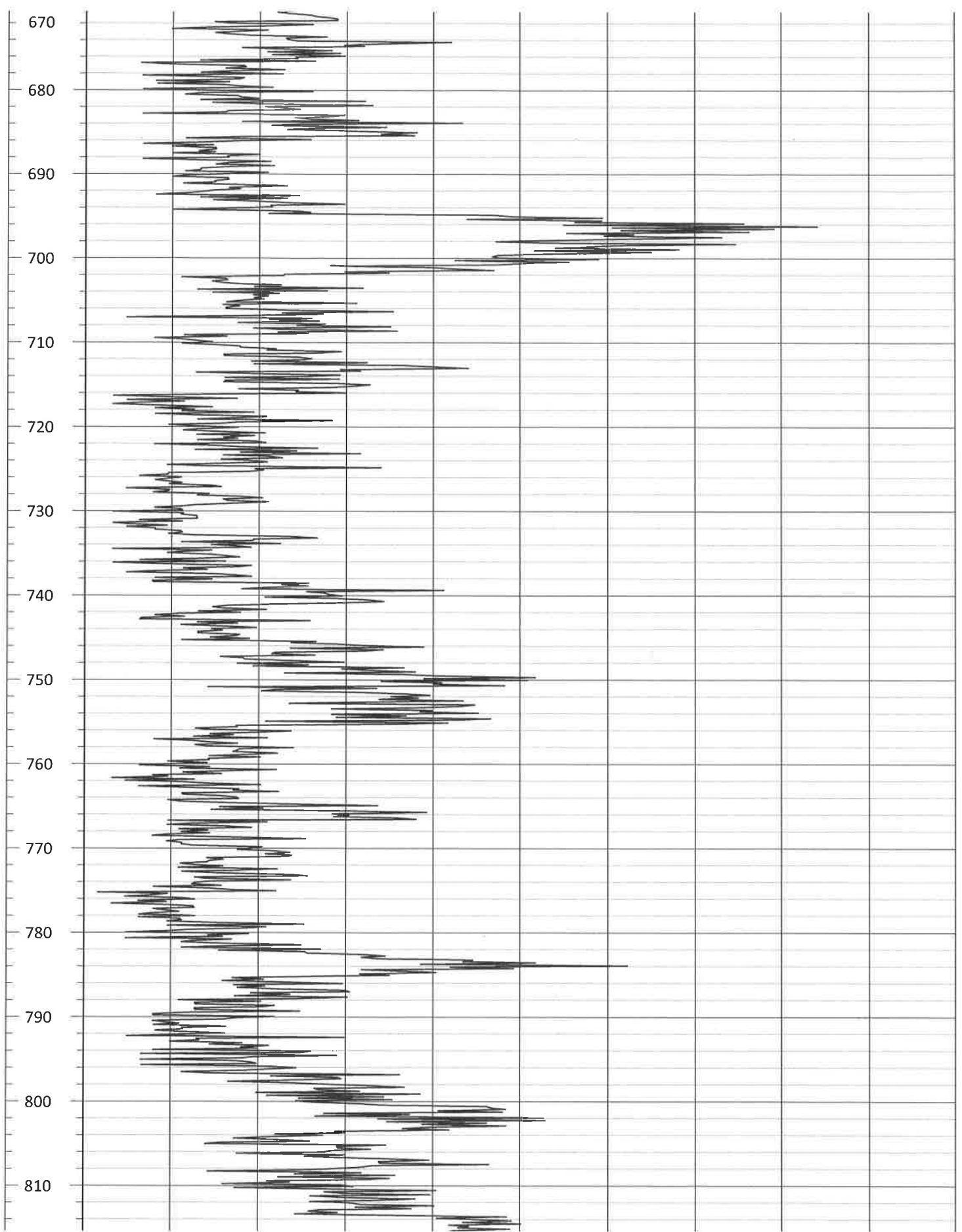
Depth (ft.)	0.0	GAMMA (cps)	100.0
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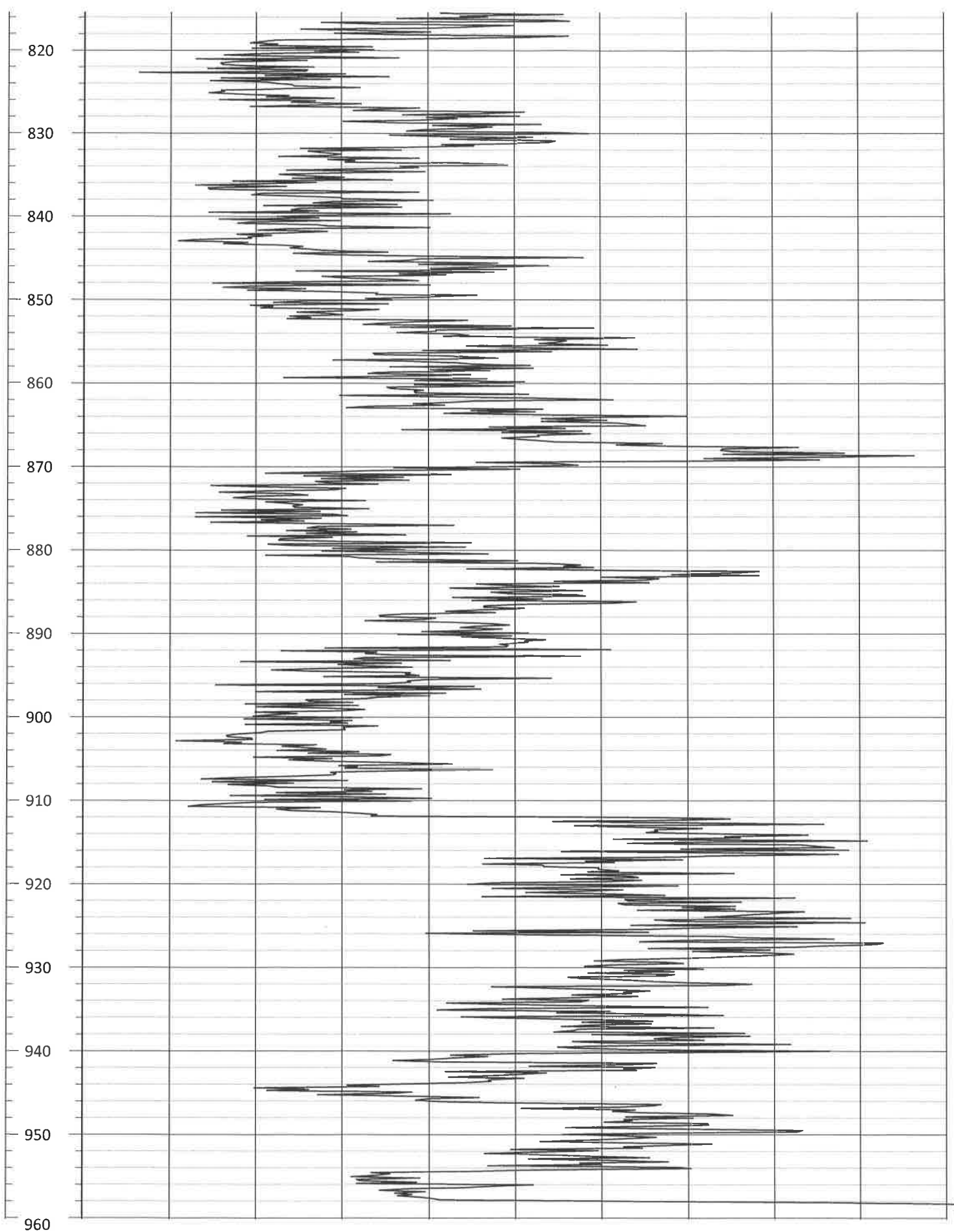
Depth (ft.)	0.0	GAMMA (cps)	100.0
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Depth (ft.)	0.0	GAMMA (cps)	100.0
-------------	-----	----------------	-------



Depth (ft.)	0.0	GAMMA (cps)	100.0
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Depth (ft.)	0.0	GAMMA (cps)	100.0
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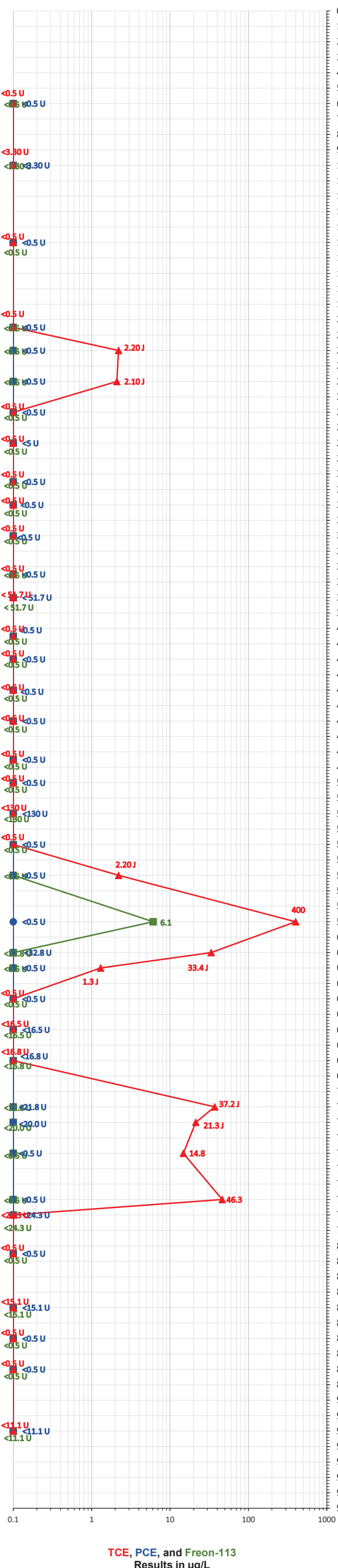
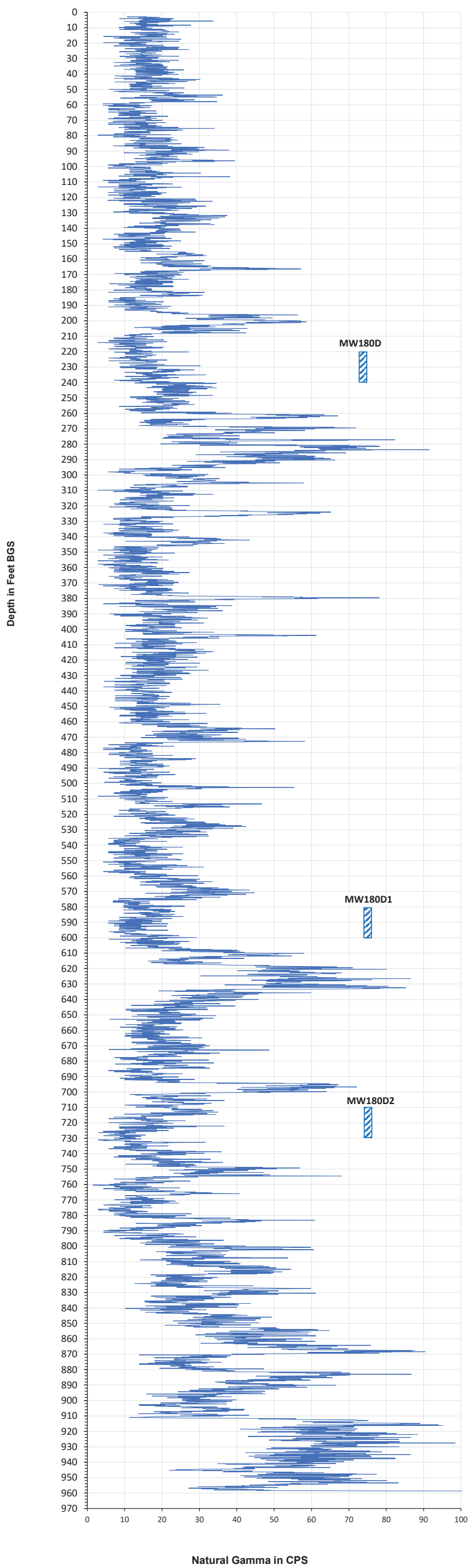
Depth (ft.)	0.0	GAMMA (cps)	100.0
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V@Áæ^Ác}q}qÁ-ó|æ\Á

2. VPB180 Gamma and PCE/TCE/Freon-113 Plot

V@Áæ^Ác}á}á^Á-á|á\Á

Vertical Profile Boring VPB-180
Downward Run - 5/7/2020
Validated Data



Depth in Feet BGS

- Legend:
- ▲ TCE Results in ug/L
 - PCE Results in ug/L
 - Freon-113 Results in ug/L
 - Monitoring Well Screen

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3. VPB180 Groundwater Sample Log Sheets

V@Áæ^Ác}á}á^Á-á|á\Á

GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-58-60	Sampled By: Varricchio
QA/QC Duplicate ID:	Sample Date: 04/06/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 11:45

WELL INFORMATION:

Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:

Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:

Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
11:45	-	-	Brown	8.07	397.3	47.3	942	16.3	-18.5	-	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	x

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-98-100	Sampled By: Varricchio
QA/QC Duplicate ID:	Sample Date: 04/06/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input type="checkbox"/>	Sample Time: 14:00

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
14:00	-	-	Brown	NOT ENOUGH RECOVERY FOR WQ PARAMETERS						-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	4	40 ml	VOA	x

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-148-150</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/07/20</u>
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: <u>1120</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1120	-	-	Cloudy	7.68	330.3	5.56	320	16.3	19.7	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	2	40 ml	VOA	x	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-203-205	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 04/07/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 1440

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1440	-	-	Light brown	7.31	226	6.16	OR	18.7	7.3	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	2	40 ml	VOA	x	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-218-220</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/08/20</u>
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: <u>1005</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1005	-	-	ellow brow	7.85	242.7	7.44	OR	15	-78.8	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	2	40 ml	VOA	x	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-238-240</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/08/20</u>
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: <u>1145</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1145	-	-	yellow brow	6.92	324.9	3.31	OR	15.6	-78.8	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	X

OBSERVATIONS / NOTES:			
Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-258-260</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/08/20</u>
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: <u>1330</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1330	-	-	Very cloudy	6.62	227.4	46.3	OR	17.3	68.1	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	2	40 ml	VOA	x	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-278-280</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/09/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>0935</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0935	-	-	Cloudy	6.33	220.2	68.6	428	13.7	137	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	2	40 ml	VOA	x	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-303-305	Sampled By: Benfield
QA/QC Duplicate ID: BP-VPB180-DUP-20200409	Sample Date: 04/09/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 1400

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1400	-	-	Very cloudy	5.88	225.3	5	545	14.8	119.4	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	X

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-318-320</u>	Sampled By: <u>Varricchio</u>
QA/QC Duplicate ID:	Sample Date: <u>04/10/20</u>
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: <u>10:15</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
10:15	-	-	Cloudy	6.88	264.4	40	462	11.6	162.3	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	2	40 ml	VOA	x	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-338-340</u>	Sampled By: <u>Varricchio</u>
QA/QC Duplicate ID: _____	Sample Date: <u>04/10/20</u>
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: <u>12:30</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:30	-	-	Dark brown	NOT ENOUGH RECOVERY FOR WQ PARAMETERS						-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	2	40 ml	VOA	x	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-363-365</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/14/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>10:45</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
10:45	-	-	Dark brown	7.31	328	4.51	OR	14.5	31.8	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	2	40 ml	VOA	x	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-378-380	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 04/14/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 12:42

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:42	-	-	Very cloudy	6.42	210.2	1.9	OR	15	38.4	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	x

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-403-405</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/15/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>9:53</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
9:53	-	-	Very cloudy	6.78	197.4	6.45	902	12.2	177.3	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	X

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-418-420</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/15/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>12:04</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:04	-	-	Very cloudy	5.9	171.4	6.17	715	15.3	143.6	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	x

OBSERVATIONS / NOTES:			
Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-438-440</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/15/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>14:08</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
14:08	-	-	Very cloudy	5.76	180	3.98	760	14.3	180.4	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	x

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-458-460</u>	Sampled By: <u>Varricchio</u>
QA/QC Duplicate ID:	Sample Date: <u>04/16/20</u>
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: <u>10:00</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
10:00	-	-	Very cloudy	6.73	178.7	3.13	OR	13.4	163.2	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	2	40 ml	VOA	x	

OBSERVATIONS / NOTES:			
Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-483-485	Sampled By: Varricchio
QA/QC Duplicate ID: BP-VPB180-DUP-20200416	Sample Date: 04/16/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 13:50

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
13:50	-	-	Very cloudy	6.68	211.8	2.68	OR	14.5	106.7	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	X

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-498-500</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/17/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>9:55</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
9:55	-	-	Very cloudy	7.35	144.2	9.86	OR	12.2	113.1	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	X

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-518-520</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/20/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>14:30</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
14:30	-	-	Brown	7.9	217.1	3.3	OR	14.4	-73.8	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	2	40 ml	VOA	x	

OBSERVATIONS / NOTES:			
Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-538-540</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/21/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>10:15</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
10:15	-	-	Brown	7.88	197.2	4.21	OR	12.8	-78.8	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	6	40 ml	VOA	x	

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-558-560</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/21/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>12:13</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:13	-	-	Brown	6.82	135.6	4.68	OR	13.7	59.6	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	6	40 ml	VOA	X

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-588-590</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/22/20</u>
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: <u>11:48</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
11:48	-	-	Light browr	8.11	199.9	2.36	OR	12.8	2.5	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	4	40 ml	VOA	X

OBSERVATIONS / NOTES:

Very turbid (extra vials)

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-608-610</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/23/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>11:36</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:												
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	
11:36	-	-	Brown	Not enough volume in HP for WQ meter								

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	5	40 ml	VOA	X

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-618-620	Sampled By: Benfield
QA/QC Duplicate ID: BP-VPB180-DUP-20200423	Sample Date: 04/23/20
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: 13:36

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
13:36	-	-	Cloudy	8.01	105.1	13.13	OR	13.3	102.2	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	X

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-638-640</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/24/20</u>
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: <u>9:33</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:												
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	
9:33	-	-	Brown	Not enough volume in HP for WQ meter								

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	3	40 ml	VOA	X

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-658-660	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 04/24/20
MS/MSD Collected: YES NO	Sample Time: 11:48

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:												
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	
11:48	-	-	Brown	Not enough volume in HP for WQ meter								

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	5	40 ml	VOA	X

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-678-680	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 04/24/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 14:07

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
14:07	-	-	Brown	Not enough volume in HP for WQ meter							

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	X

OBSERVATIONS / NOTES:			
Very turbid (extra vials)			
Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-708-710</u>	Sampled By: <u>Varricchio</u>
QA/QC Duplicate ID:	Sample Date: <u>04/27/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>15:10</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:													
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other		
15:10	-	-	Brown	Not enough volume in HP for WQ meter									

FINAL PURGE / SAMPLE DATA:												
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	6	40 ml	VOA	x

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-718-720</u>	Sampled By: <u>Varricchio</u>
QA/QC Duplicate ID:	Sample Date: <u>04/28/20</u>
MS/MSD Collected: YES <input type="checkbox"/> NO <input type="checkbox"/>	Sample Time: <u>10:10</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:													
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other		
10:10	-	-	Brown	Not enough volume in HP for WQ meter									

FINAL PURGE / SAMPLE DATA:												
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	SW846-8260B	HCl	4	40 ml	VOA	x	

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-738-740</u>	Sampled By: <u>Varricchio</u>
QA/QC Duplicate ID:	Sample Date: <u>04/28/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>12:50</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:												
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	
12:50	-	-	Brown	Not enough volume in HP for WQ meter								

FINAL PURGE / SAMPLE DATA:												
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	4	40 ml	VOA	x

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-768-770	Sampled By: Benfield
QA/QC Duplicate ID: BP-VPB180-DUP-20200429	Sample Date: 04/29/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 12:30

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:30	-	-	Milky white	8.2	141.2	18.8	OR	12.9	-60.9	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	3	40 ml	VOA	X

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s): <i>Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-778-780	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 04/29/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input type="checkbox"/>	Sample Time: 14:49

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
14:49	-	-	Brown	Not enough volume for WQ meter							

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	11	40 ml	VOA	x

OBSERVATIONS / NOTES:
Very turbid (extra vials)

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-803-805</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>04/30/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input type="checkbox"/> NO	Sample Time: <u>12:34</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:34	-	-	Gray	8.23	79.5	4	OR	13.7	61.6	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	6	40 ml	VOA	X

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-838-840</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>05/01/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>13:58</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:												
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	
13:58	-	-	Gray	Not enough volume for WQ meter								

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	3	40 ml	VOA	X

OBSERVATIONS / NOTES:
 Very turbid (extra vials)

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: <u>BP-VPB180-GW-858-860</u>	Sampled By: <u>Benfield</u>
QA/QC Duplicate ID:	Sample Date: <u>05/04/20</u>
MS/MSD Collected: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Sample Time: <u>10:12</u>

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: <u>YSI Professional Plus</u>	Pump Controller:
Turbidity Meter: <u>Hach 2100Q</u>	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
10:12	-	-	Slightly clo	8.53	54.9	10.28	186	17.6	69.8	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	x

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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GROUNDWATER SAMPLE LOG SHEET



Event: VPB-180 Hydropunch
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: BP-VPB180-GW-878-880	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 05/04/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 12:30

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI Professional Plus	Pump Controller:
Turbidity Meter: Hach 2100Q	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:30	-	-	Cloudy	8.11	64.3	3.2	576	16.4	-10.6	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC	SW846-8260B	HCl	2	40 ml	VOA	X

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
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4. VPB180 Groundwater Analytical Data Validation

Validation Letter

Chain of Custody Records

Analytical Data Sheets

V@Áæ^Ác}á}á^Á-á|á\Á

VALIDATA

Chemical Services, Inc.

2159 Wynnton Pointe, Duluth, GA 30097

(770) 232-0130

(770) 232-5082 (Fax)

www.datavalidator.com

DATA VALIDATION SUMMARY REPORT - CHEMISTRY

COMPANY: Tetra Tech, Inc., Norfolk, VA
PROJECT NAME: Basewide Groundwater Investigation, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, N62470-16-D-9008
SITE NAME: CTO-WE13
CONTRACTED LAB: CHEMTECH, Mountainside, NJ
JOB NO./ACCOUNTING CODE: 112G08005-WE13
QA/QC LEVEL: EPA Stage 4
ANALYTICAL METHOD(S): SW846 Methods 8260C
VALIDATION GUIDELINES: Tier II Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Installation Program Site 0001 – Former Drum Marshalling Area Operable Unit 2 Plume Naval Weapons Industrial Reserve Plant Bethpage, New York, March 2019, DOD QSM 5.0; July 2013, DOD Data Validation Guidance, February 2018, Method criteria, Laboratory limits and Professional Judgment
SAMPLE MATRICES: Soil and Groundwater
TYPES OF ANALYSES: Volatile Organic Compounds (VOC)
DATA VALIDATION DATE: June 15, 2020
DATA REVIEWER(S): Amy L. Hogan
SDG NUMBER: L2196
SAMPLING DATE(S): April 6-8, 2020

SAMPLES:

<u>Client Sample ID</u>	<u>Laboratory ID</u>	<u>VOC</u>
BP-VPB180-GW-98-100	L2196-05	X
BP-VPB180-TB-20200406	L2196-07	X
BP-VPB180-GW-58-60	L2196-08	X
BP-VPB180-GW-148-150	L2196-10	X
BP-VPB180-GW-203-205	L2196-11	X
BP-VPB180-GW-218-220	L2196-12	X
BP-VPB180-GW-238-240	L2196-13	X
BP-VPB180-GW-258-260	L2196-14	X
BP-VBP180-EB-20200408	L2196-15	X

Suffix Codes: DL= DILUTION, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA VALIDATION SUMMARY

CHEMTECH – SDG: L2196 – Organic Chemistry

VOLATILE ORGANICS

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW846 Method 8260C.

II.) Overall Assessment of Data:

All laboratory data were acceptable with qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No data qualification was necessary.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks for this SDG. No data qualification was necessary.

Equipment and Rinsate Blanks:

Acetone (3.20 ug/L) was detected in associated equipment blank BP-VPB180-EB-20200408. Since the blank concentration was less than the LOQ for acetone, all positive results for acetone, which were less than the LOQ, were qualified as undetected (U) with the result raised to the LOQ and reason code B.

Field Blank:

There were no associated field blanks for this SDG. No data qualification was necessary.

Trip Blank:

There were no detections in associated trip blank BP-VPB180-TB-20200406. No data qualification was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

Two LCS / LCSD sets were analyzed by the laboratory for this SDG. The calculable Relative Percent Difference (RPD) for methylcyclohexane (33%) for the water set exceeded the QC limit. The results for this compound in the associated samples, which were all non-detect, were qualified as estimated (UJ) with reason code F.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses data were not submitted for this SDG. Data qualification based on the absence of MS / MSD data was not required.

VIII.) Field Duplicates:

There were no field duplicate samples identified as part of this SDG. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All forty-three requested compounds for groundwater samples and all forty-four requested compounds for soil samples were reported with acceptable LOD and LOQ results as determined by the SAP.

The validator has noted that the non-detect results for the following compounds were reported at the LOD, which exceeds the PAL limit of 0.17 ug/L for the groundwater samples : carbon disulfide, carbon tetrachloride, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene , 1,1,2,2-tetrachloroethane, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene and 1,1,2-trichlorotrifluoroethane.

The validator has noted that the non-detect results for vinyl chloride in all groundwater samples were reported at the LOD, which exceeds the PAL limit of 0.67 ug/L.

XII.) Sample Calculation Verification (Stage 4):

No discrepancies were noted in the sample calculation verification process.

V@Áæ^Ác}á}á^Á-á|á\Á

Appendix A

Data Qualification Summary Table (DQST) with Qualification Codes

V@Áæ^Ác}á}á^Á-á|á\Á

DATA QUALIFICATION SUMMARY TABLE (DQST) WITH QUALIFICATION CODES

VOC								
Client Sample ID	Date Collected	Lab Sample ID	Analyte	Lab Qual	Val Result	VAL_RES ERROR	Val Qual	Val Reason
BP-VPB180-EB-20200408	4/8/2020 0:00	L2196-15	METHYLCYCLOHEXANE	U	0.5		UJ	F
BP-VPB180-GW-148-150	4/7/2020 0:00	L2196-10	ACETONE	J	5.1	25.0	U	B
BP-VPB180-GW-148-150	4/7/2020 0:00	L2196-10	METHYLCYCLOHEXANE	U	0.5		UJ	F
BP-VPB180-GW-203-205	4/7/2020 0:00	L2196-11	ACETONE	J	5.1	25.0	U	B
BP-VPB180-GW-203-205	4/7/2020 0:00	L2196-11	METHYLCYCLOHEXANE	U	0.5		UJ	F
BP-VPB180-GW-218-220	4/8/2020 0:00	L2196-12	ACETONE	J	6.7	25.0	U	B
BP-VPB180-GW-218-220	4/8/2020 0:00	L2196-12	METHYLCYCLOHEXANE	U	0.5		UJ	F
BP-VPB180-GW-238-240	4/8/2020 0:00	L2196-13	ACETONE	J	5.4	25.0	U	B
BP-VPB180-GW-238-240	4/8/2020 0:00	L2196-13	METHYLCYCLOHEXANE	U	0.5		UJ	F
BP-VPB180-GW-258-260	4/8/2020 0:00	L2196-14	ACETONE	J	5.2	25.0	U	B
BP-VPB180-GW-258-260	4/8/2020 0:00	L2196-14	METHYLCYCLOHEXANE	U	0.5		UJ	F
BP-VPB180-GW-58-60	4/6/2020 0:00	L2196-08	ACETONE	J	6.2	25.0	U	B
BP-VPB180-GW-58-60	4/6/2020 0:00	L2196-08	METHYLCYCLOHEXANE	U	0.5		UJ	F
BP-VPB180-TB-20200406	4/6/2020 0:00	L2196-07	METHYLCYCLOHEXANE	U	0.5		UJ	F

V@Áæ^Ác}á}á^Á-á|á\Á

Appendix B

Laboratory Sample Results

V@Áæ^Ác}á}á^Á-á|á\Á

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/06/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-TB-20200406	SDG No.:	L2196
Lab Sample ID:	L2196-07	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015631.D	1		04/10/20 18:57	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/06/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-TB-20200406	SDG No.:	L2196
Lab Sample ID:	L2196-07	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015631.D	1		04/10/20 18:57	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	45.3		81 - 118		91%	SPK: 50
1868-53-7	Dibromofluoromethane	48.8		80 - 119		98%	SPK: 50
2037-26-5	Toluene-d8	51.0		89 - 112		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	54.0		85 - 114		108%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1090000	5.64				
540-36-3	1,4-Difluorobenzene	1680000	6.83				
3114-55-4	Chlorobenzene-d5	1630000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	911000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/06/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-58-60	SDG No.:	L2196
Lab Sample ID:	L2196-08	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015638.D	1		04/10/20 21:36	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	6.20	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.78	J	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/06/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-58-60	SDG No.:	L2196
Lab Sample ID:	L2196-08	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015638.D	1		04/10/20 21:36	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	0.56	J	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.33	J	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	44.1		81 - 118		88%	SPK: 50
1868-53-7	Dibromofluoromethane	47.1		80 - 119		94%	SPK: 50
2037-26-5	Toluene-d8	50.2		89 - 112		100%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.7		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1080000	5.64				
540-36-3	1,4-Difluorobenzene	1660000	6.84				
3114-55-4	Chlorobenzene-d5	1590000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	890000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 E = Value Exceeds Calibration Range
 Q = indicates LCS control criteria did not meet requirements
 M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 N = Presumptive Evidence of a Compound
 * = Values outside of QC limits
 D = Dilution
 () = Laboratory InHouse Limit
 A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/07/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-148-150	SDG No.:	L2196
Lab Sample ID:	L2196-10	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015633.D	1		04/10/20 19:42	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	5.10	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	1.50	J	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/07/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-148-150	SDG No.:	L2196
Lab Sample ID:	L2196-10	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015633.D	1		04/10/20 19:42	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.32	J	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	0.97	J	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.47	J	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	44.9		81 - 118		90%	SPK: 50
1868-53-7	Dibromofluoromethane	47.9		80 - 119		96%	SPK: 50
2037-26-5	Toluene-d8	51.0		89 - 112		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.7		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1100000	5.64				
540-36-3	1,4-Difluorobenzene	1670000	6.83				
3114-55-4	Chlorobenzene-d5	1630000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	907000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/07/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-203-205	SDG No.:	L2196
Lab Sample ID:	L2196-11	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015634.D	1		04/10/20 20:05	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	5.10	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/07/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-203-205	SDG No.:	L2196
Lab Sample ID:	L2196-11	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015634.D	1		04/10/20 20:05	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	45.0		81 - 118		90%	SPK: 50
1868-53-7	Dibromofluoromethane	47.6		80 - 119		95%	SPK: 50
2037-26-5	Toluene-d8	50.9		89 - 112		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	54.9		85 - 114		110%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1100000	5.64				
540-36-3	1,4-Difluorobenzene	1710000	6.84				
3114-55-4	Chlorobenzene-d5	1670000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	934000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/08/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-218-220	SDG No.:	L2196
Lab Sample ID:	L2196-12	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015635.D	1		04/10/20 20:28	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	6.70	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	2.20	J	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.85	J	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/08/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-218-220	SDG No.:	L2196
Lab Sample ID:	L2196-12	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015635.D	1		04/10/20 20:28	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	0.52	J	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.31	J	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	46.5		81 - 118		93%	SPK: 50
1868-53-7	Dibromofluoromethane	47.7		80 - 119		95%	SPK: 50
2037-26-5	Toluene-d8	50.6		89 - 112		101%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.3		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1020000	5.64				
540-36-3	1,4-Difluorobenzene	1630000	6.83				
3114-55-4	Chlorobenzene-d5	1560000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	863000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/08/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-238-240	SDG No.:	L2196
Lab Sample ID:	L2196-13	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015636.D	1		04/10/20 20:50	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	5.40	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	2.10	J	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/08/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-238-240	SDG No.:	L2196
Lab Sample ID:	L2196-13	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015636.D	1		04/10/20 20:50	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	44.8		81 - 118		90%	SPK: 50
1868-53-7	Dibromofluoromethane	47.5		80 - 119		95%	SPK: 50
2037-26-5	Toluene-d8	51.1		89 - 112		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.6		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1090000	5.64				
540-36-3	1,4-Difluorobenzene	1680000	6.84				
3114-55-4	Chlorobenzene-d5	1630000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	888000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 E = Value Exceeds Calibration Range
 Q = indicates LCS control criteria did not meet requirements
 M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 N = Presumptive Evidence of a Compound
 * = Values outside of QC limits
 D = Dilution
 () = Laboratory InHouse Limit
 A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/08/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-258-260	SDG No.:	L2196
Lab Sample ID:	L2196-14	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015637.D	1		04/10/20 21:13	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	5.20	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/08/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-258-260	SDG No.:	L2196
Lab Sample ID:	L2196-14	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015637.D	1		04/10/20 21:13	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	44.2		81 - 118		88%	SPK: 50
1868-53-7	Dibromofluoromethane	47.9		80 - 119		96%	SPK: 50
2037-26-5	Toluene-d8	51.1		89 - 112		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.8		85 - 114		108%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1100000	5.64				
540-36-3	1,4-Difluorobenzene	1690000	6.83				
3114-55-4	Chlorobenzene-d5	1650000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	919000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/08/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-EB-20200408	SDG No.:	L2196
Lab Sample ID:	L2196-15	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015632.D	1		04/10/20 19:20	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	3.20	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/08/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-EB-20200408	SDG No.:	L2196
Lab Sample ID:	L2196-15	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015632.D	1		04/10/20 19:20	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	45.2		81 - 118		90%	SPK: 50
1868-53-7	Dibromofluoromethane	48.7		80 - 119		97%	SPK: 50
2037-26-5	Toluene-d8	52.0		89 - 112		104%	SPK: 50
460-00-4	4-Bromofluorobenzene	54.0		85 - 114		108%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1100000	5.64				
540-36-3	1,4-Difluorobenzene	1680000	6.84				
3114-55-4	Chlorobenzene-d5	1630000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	900000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/06/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-98-100	SDG No.:	L2196
Lab Sample ID:	L2196-05	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	24.5
Sample Wt/Vol:	5.08 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002303.D	1		04/14/20 13:12	VY041420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	3.30	U	1.90	3.30	6.50	ug/Kg
74-87-3	Chloromethane	5.20	U	2.90	5.20	6.50	ug/Kg
75-01-4	Vinyl Chloride	3.30	U	1.80	3.30	6.50	ug/Kg
74-83-9	Bromomethane	3.30	U	1.70	3.30	6.50	ug/Kg
75-00-3	Chloroethane	3.30	U	2.10	3.30	6.50	ug/Kg
75-69-4	Trichlorofluoromethane	3.30	U	1.90	3.30	6.50	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	3.30	U	2.10	3.30	6.50	ug/Kg
75-35-4	1,1-Dichloroethene	3.30	U	1.90	3.30	6.50	ug/Kg
67-64-1	Acetone	26.1	U	7.90	26.1	32.6	ug/Kg
75-15-0	Carbon Disulfide	3.30	U	1.30	3.30	6.50	ug/Kg
1634-04-4	Methyl tert-butyl Ether	5.20	U	1.80	5.20	6.50	ug/Kg
75-09-2	Methylene Chloride	10.4	U	7.40	10.4	13.0	ug/Kg
156-60-5	trans-1,2-Dichloroethene	5.20	U	2.10	5.20	6.50	ug/Kg
75-34-3	1,1-Dichloroethane	3.30	U	1.20	3.30	6.50	ug/Kg
78-93-3	2-Butanone	26.1	U	10.8	26.1	32.6	ug/Kg
56-23-5	Carbon Tetrachloride	3.30	U	1.20	3.30	6.50	ug/Kg
156-59-2	cis-1,2-Dichloroethene	3.30	U	1.80	3.30	6.50	ug/Kg
67-66-3	Chloroform	3.30	U	1.70	3.30	6.50	ug/Kg
71-55-6	1,1,1-Trichloroethane	3.30	U	0.99	3.30	6.50	ug/Kg
108-87-2	Methylcyclohexane	3.30	U	0.60	3.30	6.50	ug/Kg
71-43-2	Benzene	3.30	U	1.10	3.30	6.50	ug/Kg
107-06-2	1,2-Dichloroethane	3.30	U	1.20	3.30	6.50	ug/Kg
79-01-6	Trichloroethene	3.30	U	1.10	3.30	6.50	ug/Kg
78-87-5	1,2-Dichloropropane	3.30	U	1.20	3.30	6.50	ug/Kg
75-27-4	Bromodichloromethane	3.30	U	1.20	3.30	6.50	ug/Kg
108-10-1	4-Methyl-2-Pentanone	16.3	U	9.10	16.3	32.6	ug/Kg
108-88-3	Toluene	3.30	U	1.10	3.30	6.50	ug/Kg
10061-02-6	t-1,3-Dichloropropene	3.30	U	1.40	3.30	6.50	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	3.30	U	1.30	3.30	6.50	ug/Kg
79-00-5	1,1,2-Trichloroethane	5.20	U	1.30	5.20	6.50	ug/Kg
591-78-6	2-Hexanone	26.1	U	11.5	26.1	32.6	ug/Kg
124-48-1	Dibromochloromethane	3.30	U	1.40	3.30	6.50	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/06/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-GW-98-100	SDG No.:	L2196
Lab Sample ID:	L2196-05	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	24.5
Sample Wt/Vol:	5.08 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002303.D	1		04/14/20 13:12	VY041420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	3.30	U	1.10	3.30	6.50	ug/Kg
108-90-7	Chlorobenzene	3.30	U	1.20	3.30	6.50	ug/Kg
100-41-4	Ethyl Benzene	3.30	U	1.30	3.30	6.50	ug/Kg
179601-23-1	m/p-Xylenes	6.50	U	2.80	6.50	13.0	ug/Kg
95-47-6	o-Xylene	3.30	U	1.30	3.30	6.50	ug/Kg
100-42-5	Styrene	3.30	U	1.80	3.30	6.50	ug/Kg
75-25-2	Bromoform	5.20	U	1.60	5.20	6.50	ug/Kg
98-82-8	Isopropylbenzene	3.30	U	1.50	3.30	6.50	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	3.30	U	1.40	3.30	6.50	ug/Kg
541-73-1	1,3-Dichlorobenzene	3.30	U	1.70	3.30	6.50	ug/Kg
106-46-7	1,4-Dichlorobenzene	3.30	U	1.10	3.30	6.50	ug/Kg
95-50-1	1,2-Dichlorobenzene	5.20	U	1.40	5.20	6.50	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	52.5		71 - 136		105%	SPK: 50
1868-53-7	Dibromofluoromethane	49.6		78 - 119		99%	SPK: 50
2037-26-5	Toluene-d8	48.6		85 - 116		97%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.3		79 - 119		105%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	139000	7.8				
540-36-3	1,4-Difluorobenzene	280000	8.7				
3114-55-4	Chlorobenzene-d5	263000	11.49				
3855-82-1	1,4-Dichlorobenzene-d4	118000	13.43				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Appendix C

Support Documents

A. Documents Supporting Qualifications

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Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/08/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-EB-20200408	SDG No.:	L2196
Lab Sample ID:	L2196-15	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015632.D	1		04/10/20 19:20	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	3.20	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/08/20
Project:	CTO WE13	Date Received:	04/09/20
Client Sample ID:	BP-VPB180-EB-20200408	SDG No.:	L2196
Lab Sample ID:	L2196-15	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015632.D	1		04/10/20 19:20	VX041020

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	45.2		81 - 118		90%	SPK: 50
1868-53-7	Dibromofluoromethane	48.7		80 - 119		97%	SPK: 50
2037-26-5	Toluene-d8	52.0		89 - 112		104%	SPK: 50
460-00-4	4-Bromofluorobenzene	54.0		85 - 114		108%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1100000	5.64				
540-36-3	1,4-Difluorobenzene	1680000	6.84				
3114-55-4	Chlorobenzene-d5	1630000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	900000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Laboratory Control Sample/Laboratory Control Sample Duplicate Summary
SW-846

SDG No.: L2196
 Client: Tetra Tech NUS, Inc.
 Analytical Method: SW8260-Low

Datafile : VX015625.D

Lab Sample ID	Parameter	Spike	Result	Unit	Rec	RPD	Qual	Low	Limits	
									High	RPD
VX0410WBSD01	Chloromethane	20	18.9	ug/L	95	8		50	139	20
	Vinyl chloride	20	18.8	ug/L	94	2		58	137	20
	Bromomethane	20	26.4	ug/L	132	20		53	141	20
	Chloroethane	20	20.7	ug/L	104	6		60	138	20
	Trichlorofluoromethane	20	18.2	ug/L	91	11		65	141	20
	1,1,2-Trichlorotrifluoroethane	20	16.7	ug/L	84	16		70	136	20
	1,1-Dichloroethene	20	18.5	ug/L	93	2		71	131	20
	Acetone	100	110	ug/L	110	0		39	160	20
	Carbon disulfide	20	16.5	ug/L	83	1		64	133	20
	Methyl tert-butyl Ether	20	21.8	ug/L	109	15		71	124	20
	Methylene Chloride	20	20.7	ug/L	104	10		74	124	20
	trans-1,2-Dichloroethene	20	20.0	ug/L	100	7		75	124	20
	1,1-Dichloroethane	20	20.1	ug/L	101	9		77	125	20
	2-Butanone	100	100	ug/L	100	5		56	143	20
	Carbon Tetrachloride	20	17.2	ug/L	86	17		72	136	20
	cis-1,2-Dichloroethene	20	21.1	ug/L	106	10		78	123	20
	Chloroform	20	21.1	ug/L	106	11		79	124	20
	1,1,1-Trichloroethane	20	19.4	ug/L	97	0		74	131	20
	Methylcyclohexane	20	14.9	ug/L	75	33	*	72	132	20
	Benzene	20	19.8	ug/L	99	1		79	120	20
	1,2-Dichloroethane	20	20.7	ug/L	104	0		73	128	20
	Trichloroethene	20	20.0	ug/L	100	4		79	123	20
	1,2-Dichloropropane	20	19.7	ug/L	99	2		78	122	20
	Bromodichloromethane	20	19.9	ug/L	100	2		79	125	20
	4-Methyl-2-Pentanone	100	100	ug/L	100	1		67	130	20
	Toluene	20	20.0	ug/L	100	4		80	121	20
	t-1,3-Dichloropropene	20	19.1	ug/L	96	1		73	127	20
	cis-1,3-Dichloropropene	20	19.7	ug/L	99	1		75	124	20
	1,1,2-Trichloroethane	20	21.2	ug/L	106	2		80	119	20
	2-Hexanone	100	100	ug/L	100	0		57	139	20
	Dibromochloromethane	20	20.1	ug/L	101	0		74	126	20
	Tetrachloroethene	20	19.3	ug/L	97	7		74	129	20
	Chlorobenzene	20	19.7	ug/L	99	5		82	118	20
	Ethyl Benzene	20	19.1	ug/L	96	8		79	121	20
	m/p-Xylenes	40	38.6	ug/L	97	9		80	121	20
	o-Xylene	20	19.5	ug/L	98	7		78	122	20
	Styrene	20	19.8	ug/L	99	3		78	123	20
	Bromoform	20	18.9	ug/L	95	2		66	130	20
	Isopropylbenzene	20	18.8	ug/L	94	8		72	131	20
	1,1,2,2-Tetrachloroethane	20	19.2	ug/L	96	2		71	121	20
	1,3-Dichlorobenzene	20	19.9	ug/L	100	0		80	119	20
	1,4-Dichlorobenzene	20	19.7	ug/L	99	0		79	118	20
	1,2-Dichlorobenzene	20	20.1	ug/L	101	0		80	119	20

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Appendix C

Support Documents

B. Chain of Custody (COC)

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CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax: (908) 78-8922
www.chemtech.net

Chemtech Project Number:

L2196

COC Number:

CLIENT INFORMATION

PROJECT INFORMATION

BILLING INFORMATION

COMPANY: Tetra Tech
ADDRESS: 5700 Lake Wright Dr., Suite 102
CITY: Norfolk STATE: VA ZIP: 23502
ATTENTION: Dave Brayack
PHONE: 757-466-4909 FAX: 757-461-4148

PROJECT NAME: NWIRP Bethpage
PROJECT #: 112G08005-WE13 LOCATION: VPB-180
PROJECT MANAGER: Dave Brayack
E-MAIL: david.brayack@tetratech.com
PHONE: 757-466-4909 FAX: 757-461-4148

BILL TO: SEE CONTRACT PO#
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

DATA DELIVERABLE INFORMATION

FAX: 2 DAYS*
HARD COPY: 2 DAYS*
EDD: 2 DAYS*
* TO BE APPROVED BY CHEMTECH
STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

RESEULTS ONLY USEPA CLP
 RESULTS + QC New York State ASP "B"
 New Jersey REDUCED New York State ASP "A"
 New Jersey CLP Other _____
 EDD Format _____

ANALYSIS

VOC(S)(M)(46-826)(B)									
	1	2	3	4	5	6	7	8	9

PRESERVATIVES

COMMENTS

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# of Bottles	PRESERVATIVES									COMMENTS ← Specify Preservatives A-HCl B-HNO3 C-H2SO4 D-NaOH E-ICE F-Other		
			COMP	GRAB	DATE	TIME		A											
1.	BP-VPB180-TB-20200406	AQ		X	4/6/20	9:00	2	2											
2.	BP-VPB180-GW-58-60	AQ		X	4/6/20	11:45	2	2											
3.	BP-VPB180-GW-98-100	AQ		X	4/6/20	14:00	4	4											Very turbid
4.	BP-VPB180-GW-148-150	AQ		X	4/7/20	10:20	2	2											
5.	BP-VPB180-GW-203-205	AQ		X	4/7/20	14:40	2	2											
6.	BP-VPB180-GW-218-220	AQ		X	4/8/20	10:05	2	2											
7.	BP-VPB180-GW-238-240	AQ		X	4/8/20	11:45	2	2											
8.	BP-VPB180-GW-258-260	AQ		X	4/8/20	13:30	2	2											
9.	BP-VPB180-EB-20200408	AQ		X	4/8/20	14:00	2	2											
10.																			

43677

RELINQUISHED BY SAMPLER	DATE/TIME	RECEIVED BY
1. <i>[Signature]</i>	4/8/20	1. <i>[Signature]</i>
RELINQUISHED BY	DATE/TIME	RECEIVED BY
2. <i>[Signature]</i>	4-9-20	2. <i>[Signature]</i>
RELINQUISHED BY	DATE/TIME	RECEIVED FOR LAB BY
3. <i>[Signature]</i>		3. <i>[Signature]</i>

Conditions of bottles or coolers at receipt: Compliant Non Compliant Cooler Temp 4.5°C
MeOH extraction requires an additional 4oz. Jar for percent solid Ice in Cooler? yes
Comments:
48hr TAT - For VOC's see worksheet #15 of SAP 2018 for VPB program VOC list

Page 1 of 1 SHIPPED VIA: CLIENT: Hand Delivered Overnight
CHEMTECH: Picked Up Overnight
Shipment Complete YES NO

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

IF GUN #1

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Appendix C

Support Documents

C. Calculations for Stage 4 Data Validation

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SDG L2196

Verification calculations follow the written formula with the verification results compared to the reported value, verification value vs. reported value.

VOC (8260) SAMPLE QUANTITATION

toluene for BP-VPB180-W-148-150

$$\text{Cpd. Concentration} = \frac{(\text{Area}_c)(\text{Conc}_{istd})(V_f)(DL)}{(\text{Area}_{st})(RRF_c)(V_i)}$$

Calc. Concentration = 1.5

AREA c	AREA st	CONC istd	RRF	Vf	Vi	DL
41227	1667601	50	0.832	5000	5000	1

Reported Concentration = 1.5

VALIDATA

Chemical Services, Inc.

2159 Wynnton Pointe, Duluth, GA 30097

(770) 232-0130

(770) 232-5082 (Fax)

www.datavalidator.com

DATA VALIDATION SUMMARY REPORT - CHEMISTRY

COMPANY: Tetra Tech, Inc., Norfolk, VA
PROJECT NAME: Basewide Groundwater Investigation, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, N62470-16-D-9008
SITE NAME: CTO-WE13
CONTRACTED LAB: CHEMTECH, Mountainside, NJ
JOB NO./ACCOUNTING CODE: 112G08005-WE13
QA/QC LEVEL: EPA Stage 4
ANALYTICAL METHOD(S): SW846 Methods 8260C
VALIDATION GUIDELINES: Tier II Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Installation Program Site 0001 – Former Drum Marshalling Area Operable Unit 2 Plume Naval Weapons Industrial Reserve Plant Bethpage, New York, March 2019, DOD QSM 5.0; July 2013, DOD Data Validation Guidance, February 2018, Method criteria, Laboratory limits and Professional Judgment
SAMPLE MATRIX: Groundwater
TYPES OF ANALYSES: Volatile Organic Compounds (VOC)
DATA VALIDATION DATE: June 15, 2020
DATA REVIEWER(S): Amy L. Hogan
SDG NUMBER: L2276
SAMPLING DATE(S): April 9-10, 2020

SAMPLES:

<u>Client Sample ID</u>	<u>Laboratory ID</u>	<u>VOC</u>
BP-VPB180-TB-20200409	L2276-01	X
BP-VPB180-GW-278-280	L2276-02	X
BP-VPB180-GW-303-305	L2276-03	X
BP-VPB180-DUP-20200409	L2276-04	X
BP-VPB180-GW-318-320	L2276-05	X
BP-VPB180-GW-338-340	L2276-06	X

Suffix Codes: DL= DILUTION, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA VALIDATION SUMMARY

CHEMTECH – SDG: L2276 – Organic Chemistry

VOLATILE ORGANICS

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW846 Method 8260C.

II.) Overall Assessment of Data:

All laboratory data were acceptable with qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

The Percent Difference (%D) for the standards run on 4/16/20 at 10:23 on instrument MXVOA_X for carbon disulfide (-20.9%) exceeded the 20% QC limit. All positive and non-detect results for this compound in the SDG samples were qualified as estimated (J/UJ) with reason code C.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks for this SDG. No data qualification was necessary.

Equipment and Rinsate Blanks:

There was no associated equipment blank for this SDG. No data qualification was necessary.

Field Blank:

There were no associated field blanks for this SDG. No data qualification was necessary.

Trip Blank:

Tetrachloroethene (0.33 ug/L) was detected in associated trip blank BP-VPB180-TB-20200409. Since the blank concentration was less than the LOQ, all positive results for this compound, which were less than the LOQ, were qualified as undetected (U) with the result raised to the LOQ and reason code B.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed by the laboratory for this SDG. All criteria were met. No data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

Batch MS / MSD analyses data results were submitted for this SDG. All criteria were met. No data qualification was necessary.

VIII.) Field Duplicates:

One set of field duplicate samples (BP-VPB180-GW-303-305 / BP-VPB180-DUP-20200409) was identified as part of this SDG. The calculable difference for acetone was less than 2X the LOQ. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All forty-three requested compounds for groundwater samples were reported with acceptable LOD and LOQ results as determined by the SAP.

The validator has noted that the non-detect results for the following compounds were reported at the LOD, which exceeds the PAL limit of 0.17 ug/L for the groundwater samples : carbon disulfide, carbon tetrachloride, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene , 1,1,2,2-tetrachloroethane, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene and 1,1,2-trichlorotrifluoroethane.

The validator has noted that the non-detect results for vinyl chloride in all groundwater samples were reported at the LOD, which exceeds the PAL limit of 0.67 ug/L.

XII.) Sample Calculation Verification (Stage 4):

No discrepancies were noted in the sample calculation verification process.

Appendix A

Data Qualification Summary Table (DQST) with Qualification Codes

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DATA QUALIFICATION SUMMARY TABLE (DQST) WITH QUALIFICATION CODES

VOC								
Client Sample ID	Date Collected	Lab Sample ID	Analyte	Lab Qual	Val Result	VAL_RES ERROR	Val Qual	Val Reason
BP-VPB180-DUP-20200409	4/9/2020 0:00	L2276-04	CARBON DISULFIDE	U	0.5		UJ	C
BP-VPB180-GW-278-280	4/9/2020 0:00	L2276-02	CARBON DISULFIDE	J	0.3		J	C
BP-VPB180-GW-278-280	4/9/2020 0:00	L2276-02	TETRACHLOROETHENE	J	0.24	5.0	U	B
BP-VPB180-GW-303-305	4/9/2020 0:00	L2276-03	CARBON DISULFIDE	U	0.5		UJ	C
BP-VPB180-GW-318-320	4/10/2020 0:00	L2276-05	CARBON DISULFIDE	J	0.37		J	C
BP-VPB180-GW-338-340	4/10/2020 0:00	L2276-06	CARBON DISULFIDE	J	0.64		J	C
BP-VPB180-TB-20200409	4/9/2020 0:00	L2276-01	CARBON DISULFIDE	U	0.5		UJ	C

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Appendix B

Laboratory Sample Results

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Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/09/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-TB-20200409	SDG No.:	L2276
Lab Sample ID:	L2276-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015705.D	1		04/16/20 12:37	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.33	J	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/09/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-TB-20200409	SDG No.:	L2276
Lab Sample ID:	L2276-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015705.D	1		04/16/20 12:37	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	42.0		81 - 118		84%	SPK: 50
1868-53-7	Dibromofluoromethane	47.0		80 - 119		94%	SPK: 50
2037-26-5	Toluene-d8	50.2		89 - 112		100%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.0		85 - 114		102%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1050000	5.64				
540-36-3	1,4-Difluorobenzene	1610000	6.83				
3114-55-4	Chlorobenzene-d5	1500000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	808000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/09/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-GW-278-280	SDG No.:	L2276
Lab Sample ID:	L2276-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015714.D	1		04/16/20 16:00	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	3.70	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.30	J	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	1.10	J	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.24	J	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/09/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-GW-278-280	SDG No.:	L2276
Lab Sample ID:	L2276-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015714.D	1		04/16/20 16:00	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.32	J	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	0.61	J	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.40	J	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	43.1		81 - 118		86%	SPK: 50
1868-53-7	Dibromofluoromethane	46.2		80 - 119		92%	SPK: 50
2037-26-5	Toluene-d8	50.0		89 - 112		100%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.8		85 - 114		104%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1040000	5.63				
540-36-3	1,4-Difluorobenzene	1630000	6.83				
3114-55-4	Chlorobenzene-d5	1540000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	857000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/09/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180--GW-303-305	SDG No.:	L2276
Lab Sample ID:	L2276-03	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015715.D	1		04/16/20 16:23	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.80	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/09/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180--GW-303-305	SDG No.:	L2276
Lab Sample ID:	L2276-03	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015715.D	1		04/16/20 16:23	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	43.3		81 - 118		87%	SPK: 50
1868-53-7	Dibromofluoromethane	47.2		80 - 119		94%	SPK: 50
2037-26-5	Toluene-d8	50.3		89 - 112		101%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.2		85 - 114		104%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1060000	5.64				
540-36-3	1,4-Difluorobenzene	1660000	6.84				
3114-55-4	Chlorobenzene-d5	1590000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	882000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/09/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-DUP-20200409	SDG No.:	L2276
Lab Sample ID:	L2276-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015716.D	1		04/16/20 16:46	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.00	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/09/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-DUP-20200409	SDG No.:	L2276
Lab Sample ID:	L2276-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015716.D	1		04/16/20 16:46	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	43.6		81 - 118		87%	SPK: 50
1868-53-7	Dibromofluoromethane	47.9		80 - 119		96%	SPK: 50
2037-26-5	Toluene-d8	50.5		89 - 112		101%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.7		85 - 114		105%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1030000	5.64				
540-36-3	1,4-Difluorobenzene	1610000	6.83				
3114-55-4	Chlorobenzene-d5	1540000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	864000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/10/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-GW-318-320	SDG No.:	L2276
Lab Sample ID:	L2276-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015717.D	1		04/16/20 17:08	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	4.00	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.37	J	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.22	J	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/10/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-GW-318-320	SDG No.:	L2276
Lab Sample ID:	L2276-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015717.D	1		04/16/20 17:08	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	43.1		81 - 118		86%	SPK: 50
1868-53-7	Dibromofluoromethane	47.5		80 - 119		95%	SPK: 50
2037-26-5	Toluene-d8	50.4		89 - 112		101%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.1		85 - 114		102%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1020000	5.64				
540-36-3	1,4-Difluorobenzene	1590000	6.83				
3114-55-4	Chlorobenzene-d5	1530000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	825000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/10/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-GW-338-340	SDG No.:	L2276
Lab Sample ID:	L2276-06	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015718.D	1		04/16/20 17:31	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.41	J	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	5.30	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.64	J	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/10/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-GW-338-340	SDG No.:	L2276
Lab Sample ID:	L2276-06	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015718.D	1		04/16/20 17:31	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	41.8		81 - 118		84%	SPK: 50
1868-53-7	Dibromofluoromethane	47.8		80 - 119		96%	SPK: 50
2037-26-5	Toluene-d8	51.1		89 - 112		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.8		85 - 114		104%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1020000	5.64				
540-36-3	1,4-Difluorobenzene	1530000	6.83				
3114-55-4	Chlorobenzene-d5	1490000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	806000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Appendix C

Support Documents

A. Documents Supporting Qualifications

V@Áæ^Ác}á}á^Á-á|á\Á

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CHEMTECH Contract: TETRO6
 Lab Code: CHEM Case No.: L2276 SAS No.: L2276 SDG No.: L2276
 Instrument ID: MSVOA_X Calibration Date/Time: 04/16/2020 10:23
 Lab File ID: VX015701.D Init. Calib. Date(s): 03/26/2020 03/26/2020
 Heated Purge: (Y/N) N Init. Calib. Time(s): 19:31 21:24
 GC Column: DB-624UI ID: 0.18 (mm)

COMPOUND	RRF	RRF050	MIN RRF	%D	MAX%D
Chloromethane	0.561	0.467	0.1	-16.76	20
Vinyl Chloride	0.515	0.472		-8.35	20
Bromomethane	0.259	0.243		-6.18	20
Chloroethane	0.319	0.296		-7.21	20
Trichlorofluoromethane	0.691	0.662		-4.2	20
1,1,2-Trichlorotrifluoroethane	0.450	0.448		-0.44	20
1,1-Dichloroethene	0.472	0.421		-10.81	20
Acetone	0.303	0.314		3.63	20
Carbon Disulfide	1.440	1.139		-20.9	20
Methyl tert-butyl Ether	1.831	1.601		-12.56	20
Methylene Chloride	0.566	0.488		-13.78	20
trans-1,2-Dichloroethene	0.524	0.466		-11.07	20
1,1-Dichloroethane	1.029	0.898	0.1	-12.73	20
2-Butanone	0.487	0.424		-12.94	20
Carbon Tetrachloride	0.499	0.495		-0.8	20
cis-1,2-Dichloroethene	0.606	0.553		-8.75	20
Chloroform	0.990	0.879		-11.21	20
1,1,1-Trichloroethane	0.896	0.805		-10.16	20
Methylcyclohexane	0.531	0.567		6.78	20
Benzene	1.350	1.362		0.96	20
1,2-Dichloroethane	0.542	0.522		-3.69	20
Trichloroethene	0.368	0.396		7.61	20
1,2-Dichloropropane	0.369	0.366		-0.81	20
Bromodichloromethane	0.516	0.507		-1.74	20
4-Methyl-2-Pentanone	0.574	0.538		-6.27	20
Toluene	0.832	0.871		4.69	20
t-1,3-Dichloropropene	0.605	0.581		-3.97	20
cis-1,3-Dichloropropene	0.616	0.615		-0.16	20
1,1,2-Trichloroethane	0.341	0.351		2.93	20
2-Hexanone	0.433	0.418		-3.46	20
Dibromochloromethane	0.410	0.414		0.98	20
Tetrachloroethene	0.377	0.397		5.3	20
Chlorobenzene	0.997	1.019	0.3	2.21	20
Ethyl Benzene	1.769	1.820		2.88	20
m/p-Xylenes	0.659	0.684		3.79	20
o-Xylene	0.651	0.671		3.07	20
Styrene	1.145	1.183		3.32	20
Bromoform	0.363	0.348	0.1	-4.13	20
Isopropylbenzene	3.276	3.309		1.01	20

All other compounds must meet a minimum RRF of 0.010.
 RRF of 1,4-Dioxane = Value should be divide by 1000.

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/09/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-TB-20200409	SDG No.:	L2276
Lab Sample ID:	L2276-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015705.D	1		04/16/20 12:37	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.33	J	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/09/20
Project:	CTO WE13	Date Received:	04/14/20
Client Sample ID:	BP-VPB180-TB-20200409	SDG No.:	L2276
Lab Sample ID:	L2276-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX015705.D	1		04/16/20 12:37	VX041620

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	42.0		81 - 118		84%	SPK: 50
1868-53-7	Dibromofluoromethane	47.0		80 - 119		94%	SPK: 50
2037-26-5	Toluene-d8	50.2		89 - 112		100%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.0		85 - 114		102%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	1050000	5.64				
540-36-3	1,4-Difluorobenzene	1610000	6.83				
3114-55-4	Chlorobenzene-d5	1500000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	808000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

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Appendix C

Support Documents

B. Chain of Custody (COC)

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L2276



CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
 (908) 789-8900 Fax: (908) 78-8922
 www.chemtech.net

Chemtech Project Number:

COC Number:

CLIENT INFORMATION		PROJECT INFORMATION		BILLING INFORMATION	
COMPANY: Tetra Tech		PROJECT NAME: NWIRP Bethpage		BILL TO: SEE CONTRACT PO#	
ADDRESS: 5700 Lake Wright Dr., Suite 102		PROJECT #: 112G08005-WE13 LOCATION: VPB-180		ADDRESS:	
CITY: Norfolk STATE: VA ZIP: 23502		PROJECT MANAGER: Dave Brayack		CITY: STATE: ZIP:	
ATTENTION: Dave Brayack		E-MAIL: david.brayack@tetrattech.com		ATTENTION: PHONE:	
PHONE: 757-466-4909 FAX: 757-461-4148		PHONE: 757-466-4909 FAX: 757-461-4148			

DATA TURNAROUND INFORMATION		DATA DELIVERABLE INFORMATION		ANALYSIS									COMMENTS
FAX: _____ 2 _____ DAYS*		<input type="checkbox"/> RESEULTS ONLY <input type="checkbox"/> USEPA CLP		VOC(S) (SW846-62603) 1 2 3 4 5 6 7 8 9									
HARD COPY: _____ 2 _____ DAYS*		<input type="checkbox"/> RESULTS + QC <input type="checkbox"/> New York State ASP "B"											
EDD _____ 2 _____ DAYS*		<input type="checkbox"/> New Jersey REDUCED <input type="checkbox"/> New York State ASP "A"											
* TO BE APPROVED BY CHEMTECH		<input type="checkbox"/> New Jersey CLP <input type="checkbox"/> Other _____											
STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS		<input type="checkbox"/> EDD Format _____											

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# of Bottles	PRESERVATIVES									COMMENTS <-- Specify Preservatives A-HCl B-HNO3 C-H2SO4 D-NaOH E-ICE F-Other		
			COMP	GRAB	DATE	TIME		A	1	2	3	4	5	6	7	8		9	
1.	BP-VPB180-TB-20200409	AQ		X	4/9/20	9:00	2	2											
2.	BP-VPB180-GW-278-280	AQ		X	4/9/20	9:35	2	2											
3.	BP-VPB180-GW-303-305	AQ		X	4/9/20	14:00	2	2											
4.	BP-VPB180-DUP-20200409	AQ		X	4/9/20	11:00	2	2											
5.	BP-VPB180-GW-318-320	AQ		X	4/10/20	10:15	2	2											
6.	BP-VPB180-GW-338-340	AQ		X	4/10/20	12:30	2	2											
7.																			
8.																			
9.																			
10.																			

43677			
RELINQUISHED BY SAMPLER	DATE/TIME	RECEIVED BY	Conditions of bottles or coolers at receipt: <input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Cooler Temp <u>2.5°C</u> MeOH extraction requires an additional 4oz. Jar for percent solid <input type="checkbox"/> Ice in Cooler? <u>YES</u> Comments: 48hr TAT - For VOC's see worksheet #15 of SAP 2018 for VPB program VOC list
1. <u>UT</u>	<u>4/13/2020</u>	1. _____	
RELINQUISHED BY	DATE/TIME	RECEIVED BY	
2. _____	<u>4-14-20</u>	2. <u>Ch</u>	SHIPPED VIA: CLIENT: <input type="checkbox"/> Hand Delivered <input checked="" type="checkbox"/> Overnight CHEMTECH: <input type="checkbox"/> Picked Up <input type="checkbox"/> Overnight
RELINQUISHED BY	DATE/TIME	RECEIVED FOR LAB BY	
3. _____		3. _____	Page <u>1</u> of <u>1</u>
			Shipment Complete <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

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Appendix C

Support Documents

C. Calculations for Stage 4 Data Validation

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SDG L2276

Verification calculations follow the written formula with the verification results compared to the reported value, verification value vs. reported value.

VOC (8260) SAMPLE QUANTITATION

carbon disulfide for BP-VPB180-GW-278-280

$$\text{Cpd. Concentration} = \frac{(\text{Area}_c)(\text{Conc}_{istd})(V_f)(DL)}{(\text{Area}_{st})(RRF_c)(V_i)}$$

Calc. Concentration = 0.3

AREA c	AREA st	CONC istd	RRF	Vf	Vi	DL
9099	1038466	50	1.44	5000	5000	1

Reported Concentration = 0.3

VALIDATA

Chemical Services, Inc.

2159 Wynnton Pointe, Duluth, GA 30097

(770) 232-0130

(770) 232-5082 (Fax)

www.datavalidator.com

DATA VALIDATION SUMMARY REPORT - CHEMISTRY

COMPANY: Tetra Tech, Inc., Norfolk, VA
PROJECT NAME: Basewide Groundwater Investigation, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, N62470-16-D-9008
SITE NAME: CTO-WE13
CONTRACTED LAB: CHEMTECH, Mountainside, NJ
JOB NO./ACCOUNTING CODE: 112G08005-WE13
QA/QC LEVEL: EPA Stage 4
ANALYTICAL METHOD(S): SW846 Methods 8260C
VALIDATION GUIDELINES: Tier II Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Installation Program Site 0001 – Former Drum Marshalling Area Operable Unit 2 Plume Naval Weapons Industrial Reserve Plant Bethpage, New York, March 2019, DOD QSM 5.0; July 2013, DOD Data Validation Guidance, February 2018, Method criteria, Laboratory limits and Professional Judgment
SAMPLE MATRICES: Soil and Groundwater
TYPES OF ANALYSES: Volatile Organic Compounds (VOC)
DATA VALIDATION DATE: June 16, 2020
DATA REVIEWER(S): Amy L. Hogan
SDG NUMBER: L2337
SAMPLING DATE(S): April 14-16, 2020

SAMPLES:

<u>Client Sample ID</u>	<u>Laboratory ID</u>	<u>VOC</u>
BP-VPB180-TB-20200414	L2337-01	X
BP-VPB180-GW-363-365	L2337-02	X
BP-VPB180-GW-403-405	L2337-04	X
BP-VPB180-GW-403-405MS	L2337-05	X
BP-VPB180-GW-403-405MSD	L2337-06	X
BP-VPB180-GW-418-420	L2337-07	X
BP-VPB180-GW-438-440	L2337-08	X
BP-VPB180-GW-458-460	L2337-09	X
BP-VBP180-EB-20200416	L2337-10	X
BP-VPB180-GW-483-485	L2337-11	X
BP-VPB180-DUP-20200416	L2337-12	X
BP-VPB180-378-380	L2337-13	X

Suffix Codes: DL= DILUTION, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA VALIDATION SUMMARY

CHEMTECH – SDG: L2337 – Organic Chemistry

VOLATILE ORGANICS

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW846 Method 8260C.

II.) Overall Assessment of Data:

All laboratory data were acceptable with qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

The Percent Difference (%D) for the standards run on 4/15/20 at 17:51 on instrument MSVOA_D for methylene chloride (-24.5%) exceeded the 20% QC limit. The non-detect result for this

compound in associated sample BP-VPB180-378-380 was qualified as estimated (UJ) with reason code C.

Continuing Calibration:

The Percent Difference (%D) for the standards run on 4/17/20 at 13:16 on instrument MSVOA_D for carbon disulfide (20.38%) exceeded the 20% QC limit. The non-detect result for this compound in associated sample BP-VPB180-378-380 was qualified as estimated (UJ) with reason code C.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks for this SDG. No data qualification was necessary.

Equipment and Rinsate Blanks:

There were no detections in associated equipment blank BP-VPB180-EB-20200416. No data qualification was necessary.

Field Blank:

There were no associated field blanks for this SDG. No data qualification was necessary.

Trip Blank:

There were no detections in associated trip blank BP-VPB180-TB-20200414. No data qualification was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

Two LCS and one LCS / LCSD set were analyzed by the laboratory for this SDG. The Percent Recoveries (%Rs) for methylene chloride (155%) and trans-1,2-dichloroethene (70%) for the soil LCS set were outside the QC limits. The non-detect result for trans-1,2-dichloroethene for associated sample BP-VPB180-378-380 was qualified as estimated (UJ) with reason code E. Since the methylene chloride result for the associated sample was non-detect, no data qualification was necessary based on the LCS %R. The calculable Relative Percent Differences (RPDs) for the soil set exceeded the QC limit for the following compounds:

1,1,2-trichlorotrifluoroethane	40%
1,1-dichloroethene	46%
acetone	45%
carbon disulfide	33%
MTBE	26%
methylene chloride	23%
trans-1,2-dichloroethene	38%

The results for these compounds in the associated sample, which consisted entirely of non-detects, were qualified as estimated (UJ) with reason code F.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were performed using sample BP-VPB180-GW-403-405. All criteria were met. No data qualification was necessary.

VIII.) Field Duplicates:

One set of field duplicate samples (BP-VPB180-GW-483-485 / BP-VPB180-DUP-20200416) was identified as part of this SDG. The calculable difference for acetone was less than 2X the LOQ. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All forty-three requested compounds for groundwater samples and all forty-four requested compounds for soil samples were reported with acceptable LOD and LOQ results as determined by the SAP.

The validator has noted that the non-detect results for the following compounds were reported at the LOD, which exceeds the PAL limit of 0.17 ug/L for the groundwater samples : carbon disulfide, carbon tetrachloride, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene , 1,1,2,2-tetrachloroethane, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene and 1,1,2-trichlorotrifluoroethane.

The validator has noted that the non-detect results for vinyl chloride in all groundwater samples were reported at the LOD, which exceeds the PAL limit of 0.67 ug/L.

XII.) Sample Calculation Verification (Stage 4):

No discrepancies were noted in the sample calculation verification process.

Appendix A

Data Qualification Summary Table (DQST) with Qualification Codes

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DATA QUALIFICATION SUMMARY TABLE (DQST) WITH QUALIFICATION CODES

VOC								
Client Sample ID	Date Collected	Lab Sample ID	Analyte	Lab Qual	Val Result	VAL_RES ERROR	Val Qual	Val Reason
BP-VPB180-378-380	4/14/2020 0:00	L2337-13	TRICHLOROTRIFLUOROETHANE	U	51.7		UJ	F
BP-VPB180-378-380	4/14/2020 0:00	L2337-13	1,1-DICHLOROETHENE	U	51.7		UJ	F
BP-VPB180-378-380	4/14/2020 0:00	L2337-13	ACETONE	U	410		UJ	F
BP-VPB180-378-380	4/14/2020 0:00	L2337-13	CARBON DISULFIDE	U	51.7		UJ	C,F
BP-VPB180-378-380	4/14/2020 0:00	L2337-13	METHYL TERT-BUTYL ETHER	U	82.7		UJ	F
BP-VPB180-378-380	4/14/2020 0:00	L2337-13	METHYLENE CHLORIDE	U	170		UJ	C,F
BP-VPB180-378-380	4/14/2020 0:00	L2337-13	TRANS-1,2-DICHLOROETHENE	U	82.7		UJ	E,F

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Appendix B

Laboratory Sample Results

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Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/14/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-TB-20200414	SDG No.:	L2337
Lab Sample ID:	L2337-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061052.D	1		04/17/20 15:46	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/14/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-TB-20200414	SDG No.:	L2337
Lab Sample ID:	L2337-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061052.D	1		04/17/20 15:46	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53.2		81 - 118		106%	SPK: 50
1868-53-7	Dibromofluoromethane	51.3		80 - 119		103%	SPK: 50
2037-26-5	Toluene-d8	56.1		89 - 112		112%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.4		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	144000	7.64				
540-36-3	1,4-Difluorobenzene	244000	8.56				
3114-55-4	Chlorobenzene-d5	228000	11.4				
3855-82-1	1,4-Dichlorobenzene-d4	98100	13.34				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/14/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-363-365	SDG No.:	L2337
Lab Sample ID:	L2337-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061138.D	1		04/22/20 19:32	VN042220

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	3.70	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/14/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-363-365	SDG No.:	L2337
Lab Sample ID:	L2337-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061138.D	1		04/22/20 19:32	VN042220

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	46.8		81 - 118		94%	SPK: 50
1868-53-7	Dibromofluoromethane	50.7		80 - 119		101%	SPK: 50
2037-26-5	Toluene-d8	50.3		89 - 112		101%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.9		85 - 114		106%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	178000	7.4				
540-36-3	1,4-Difluorobenzene	291000	8.35				
3114-55-4	Chlorobenzene-d5	284000	11.21				
3855-82-1	1,4-Dichlorobenzene-d4	138000	13.15				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/15/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-403-405	SDG No.:	L2337
Lab Sample ID:	L2337-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061055.D	1		04/17/20 16:54	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	3.30	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/15/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-403-405	SDG No.:	L2337
Lab Sample ID:	L2337-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061055.D	1		04/17/20 16:54	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53.9		81 - 118		108%	SPK: 50
1868-53-7	Dibromofluoromethane	51.9		80 - 119		104%	SPK: 50
2037-26-5	Toluene-d8	56.2		89 - 112		112%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.2		85 - 114		106%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	147000	7.64				
540-36-3	1,4-Difluorobenzene	253000	8.56				
3114-55-4	Chlorobenzene-d5	240000	11.4				
3855-82-1	1,4-Dichlorobenzene-d4	105000	13.34				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/15/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-418-420	SDG No.:	L2337
Lab Sample ID:	L2337-07	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061056.D	1		04/17/20 17:16	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/15/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-418-420	SDG No.:	L2337
Lab Sample ID:	L2337-07	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061056.D	1		04/17/20 17:16	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53.5		81 - 118		107%	SPK: 50
1868-53-7	Dibromofluoromethane	52.1		80 - 119		104%	SPK: 50
2037-26-5	Toluene-d8	56.2		89 - 112		112%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.1		85 - 114		104%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	145000	7.64				
540-36-3	1,4-Difluorobenzene	247000	8.56				
3114-55-4	Chlorobenzene-d5	232000	11.4				
3855-82-1	1,4-Dichlorobenzene-d4	101000	13.34				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/15/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-438-440	SDG No.:	L2337
Lab Sample ID:	L2337-08	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061057.D	1		04/17/20 17:39	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/15/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-438-440	SDG No.:	L2337
Lab Sample ID:	L2337-08	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061057.D	1		04/17/20 17:39	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53.8		81 - 118		108%	SPK: 50
1868-53-7	Dibromofluoromethane	52.2		80 - 119		104%	SPK: 50
2037-26-5	Toluene-d8	55.6		89 - 112		111%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.2		85 - 114		106%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	148000	7.64				
540-36-3	1,4-Difluorobenzene	253000	8.56				
3114-55-4	Chlorobenzene-d5	237000	11.4				
3855-82-1	1,4-Dichlorobenzene-d4	105000	13.34				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/16/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-458-460	SDG No.:	L2337
Lab Sample ID:	L2337-09	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061058.D	1		04/17/20 18:02	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	3.80	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/16/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-458-460	SDG No.:	L2337
Lab Sample ID:	L2337-09	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061058.D	1		04/17/20 18:02	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53.9		81 - 118		108%	SPK: 50
1868-53-7	Dibromofluoromethane	52.0		80 - 119		104%	SPK: 50
2037-26-5	Toluene-d8	55.9		89 - 112		112%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.9		85 - 114		106%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	141000	7.64				
540-36-3	1,4-Difluorobenzene	243000	8.56				
3114-55-4	Chlorobenzene-d5	227000	11.4				
3855-82-1	1,4-Dichlorobenzene-d4	98300	13.34				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/16/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-EB-20200416	SDG No.:	L2337
Lab Sample ID:	L2337-10	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061137.D	1		04/22/20 19:09	VN042220

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/16/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-EB-20200416	SDG No.:	L2337
Lab Sample ID:	L2337-10	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061137.D	1		04/22/20 19:09	VN042220

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	47.6		81 - 118		95%	SPK: 50
1868-53-7	Dibromofluoromethane	45.3		80 - 119		91%	SPK: 50
2037-26-5	Toluene-d8	50.3		89 - 112		101%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.7		85 - 114		103%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	186000	7.4				
540-36-3	1,4-Difluorobenzene	308000	8.35				
3114-55-4	Chlorobenzene-d5	292000	11.21				
3855-82-1	1,4-Dichlorobenzene-d4	141000	13.15				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/16/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-483-485	SDG No.:	L2337
Lab Sample ID:	L2337-11	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061139.D	1		04/22/20 19:54	VN042220

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.70	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.87	J	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/16/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-GW-483-485	SDG No.:	L2337
Lab Sample ID:	L2337-11	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061139.D	1		04/22/20 19:54	VN042220

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	47.1		81 - 118		94%	SPK: 50
1868-53-7	Dibromofluoromethane	50.0		80 - 119		100%	SPK: 50
2037-26-5	Toluene-d8	50.4		89 - 112		101%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.0		85 - 114		104%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	194000	7.4				
540-36-3	1,4-Difluorobenzene	319000	8.35				
3114-55-4	Chlorobenzene-d5	308000	11.21				
3855-82-1	1,4-Dichlorobenzene-d4	148000	13.15				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/16/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-DUP-20200416	SDG No.:	L2337
Lab Sample ID:	L2337-12	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061060.D	1		04/17/20 18:47	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	3.90	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/16/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-DUP-20200416	SDG No.:	L2337
Lab Sample ID:	L2337-12	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061060.D	1		04/17/20 18:47	VN041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53.7		81 - 118		107%	SPK: 50
1868-53-7	Dibromofluoromethane	51.0		80 - 119		102%	SPK: 50
2037-26-5	Toluene-d8	55.9		89 - 112		112%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.0		85 - 114		106%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	151000	7.64				
540-36-3	1,4-Difluorobenzene	261000	8.56				
3114-55-4	Chlorobenzene-d5	245000	11.4				
3855-82-1	1,4-Dichlorobenzene-d4	109000	13.34				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/14/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-378-380	SDG No.:	L2337
Lab Sample ID:	L2337-13	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	95.2
Sample Wt/Vol:	5.04 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VD065645.D	1		04/17/20 15:29	VD041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	51.7	U	30.3	51.7	100	ug/Kg
74-87-3	Chloromethane	82.7	U	46.1	82.7	100	ug/Kg
75-01-4	Vinyl Chloride	51.7	U	28.6	51.7	100	ug/Kg
74-83-9	Bromomethane	51.7	U	26.9	51.7	100	ug/Kg
75-00-3	Chloroethane	51.7	U	33.9	51.7	100	ug/Kg
75-69-4	Trichlorofluoromethane	51.7	U	30.9	51.7	100	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	51.7	U	34.0	51.7	100	ug/Kg
75-35-4	1,1-Dichloroethene	51.7	U	29.4	51.7	100	ug/Kg
67-64-1	Acetone	410	U	130	410	520	ug/Kg
75-15-0	Carbon Disulfide	51.7	U	20.1	51.7	100	ug/Kg
1634-04-4	Methyl tert-butyl Ether	82.7	U	29.3	82.7	100	ug/Kg
75-09-2	Methylene Chloride	170	UQ	120	170	210	ug/Kg
156-60-5	trans-1,2-Dichloroethene	82.7	UQ	32.8	82.7	100	ug/Kg
75-34-3	1,1-Dichloroethane	51.7	U	19.5	51.7	100	ug/Kg
78-93-3	2-Butanone	410	U	170	410	520	ug/Kg
56-23-5	Carbon Tetrachloride	51.7	U	18.4	51.7	100	ug/Kg
156-59-2	cis-1,2-Dichloroethene	51.7	U	28.8	51.7	100	ug/Kg
67-66-3	Chloroform	51.7	U	26.3	51.7	100	ug/Kg
71-55-6	1,1,1-Trichloroethane	51.7	U	15.7	51.7	100	ug/Kg
108-87-2	Methylcyclohexane	51.7	U	9.50	51.7	100	ug/Kg
71-43-2	Benzene	51.7	U	17.6	51.7	100	ug/Kg
107-06-2	1,2-Dichloroethane	51.7	U	18.8	51.7	100	ug/Kg
79-01-6	Trichloroethene	51.7	U	17.5	51.7	100	ug/Kg
78-87-5	1,2-Dichloropropane	51.7	U	18.3	51.7	100	ug/Kg
75-27-4	Bromodichloromethane	51.7	U	18.6	51.7	100	ug/Kg
108-10-1	4-Methyl-2-Pentanone	260	U	140	260	520	ug/Kg
108-88-3	Toluene	51.7	U	17.7	51.7	100	ug/Kg
10061-02-6	t-1,3-Dichloropropene	51.7	U	22.2	51.7	100	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	51.7	U	20.3	51.7	100	ug/Kg
79-00-5	1,1,2-Trichloroethane	82.7	U	20.5	82.7	100	ug/Kg
591-78-6	2-Hexanone	410	U	180	410	520	ug/Kg
124-48-1	Dibromochloromethane	51.7	U	22.0	51.7	100	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/14/20
Project:	CTO WE13	Date Received:	04/17/20
Client Sample ID:	BP-VPB180-378-380	SDG No.:	L2337
Lab Sample ID:	L2337-13	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	95.2
Sample Wt/Vol:	5.04 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VD065645.D	1		04/17/20 15:29	VD041720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	51.7	U	18.0	51.7	100	ug/Kg
108-90-7	Chlorobenzene	51.7	U	18.5	51.7	100	ug/Kg
100-41-4	Ethyl Benzene	51.7	U	21.4	51.7	100	ug/Kg
179601-23-1	m/p-Xylenes	100	U	44.8	100	210	ug/Kg
95-47-6	o-Xylene	51.7	U	20.6	51.7	100	ug/Kg
100-42-5	Styrene	51.7	U	28.5	51.7	100	ug/Kg
75-25-2	Bromoform	82.7	U	24.9	82.7	100	ug/Kg
98-82-8	Isopropylbenzene	51.7	U	23.5	51.7	100	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	51.7	U	22.0	51.7	100	ug/Kg
541-73-1	1,3-Dichlorobenzene	51.7	U	26.7	51.7	100	ug/Kg
106-46-7	1,4-Dichlorobenzene	51.7	U	17.6	51.7	100	ug/Kg
95-50-1	1,2-Dichlorobenzene	82.7	U	21.5	82.7	100	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	60.5	*	71 - 136		121%	SPK: 50
1868-53-7	Dibromofluoromethane	55.1		78 - 119		110%	SPK: 50
2037-26-5	Toluene-d8	53.0		85 - 116		106%	SPK: 50
460-00-4	4-Bromofluorobenzene	55.1		79 - 119		110%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	187000	7.98				
540-36-3	1,4-Difluorobenzene	287000	8.87				
3114-55-4	Chlorobenzene-d5	287000	11.65				
3855-82-1	1,4-Dichlorobenzene-d4	127000	13.58				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Appendix C

Support Documents

A. Documents Supporting Qualifications

V@Áæ^Ác}á}á^Á-á|á\Á

Data Path : Z:\voasrv\HPCHEM1\MSVOA D\Data\VD041520\
 Data File : VD065639.D
 Acq On : 15 Apr 2020 17:51
 Operator : VA/SY
 Sample : VSTDICV050
 Misc : 5.00G/5.00ml/MSVOA D/SOIL
 ALS Vial : 11 Sample Multiplier: 1

Instrument :
 MSVOA_D
 ClientSampled :
 ICVVD041520

Quant Time: Apr 16 04:01:11 2020
 Quant Method : Z:\VOASRV\HPCHEM1\MSVOA_D\METHOD\82D041520S.M
 Quant Title : SW846 8260
 QLast Update : Wed Apr 15 19:43:39 2020
 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Pentafluorobenzene	50.000	50.000	0.0	106	0.00
2 T	Dichlorodifluoromethane	50.000	53.154	-6.3	106	0.00
3 P	Chloromethane	50.000	49.659	0.7	105	0.00
4 C	Vinyl Chloride	50.000	49.218	1.6#	105	0.00
5 T	Bromomethane	50.000	51.989	-4.0	116	0.00
6 T	Chloroethane	50.000	49.019	2.0	105	0.00
7 T	Trichlorofluoromethane	50.000	48.942	2.1	106	0.00
8 T	Diethyl Ether	50.000	49.497	1.0	99	0.00
9 T	1,1,2-Trichlorotrifluoroeth	50.000	49.564	0.9	107	0.00
10 T	Methyl Iodide	50.000	37.051	25.9#	100	0.00
11 T	Tert butyl alcohol	250.000	243.739	2.5	130	0.00
12 CM	1,1-Dichloroethene	50.000	49.303	1.4#	106	0.00
13 T	Acrolein	250.000	252.299	-0.9	89	0.00
14 T	Allyl chloride	50.000	59.783	-19.6	161	0.00
15 T	Acrylonitrile	250.000	276.703	-10.7	146	0.00
16 T	Acetone	250.000	220.444	11.8	91	0.00
17 T	Carbon Disulfide	50.000	46.593	6.8	130	0.00
18 T	Methyl Acetate	50.000	55.077	-10.2	152	0.00
19 T	Methyl tert-butyl Ether	50.000	56.797	-13.6	141	0.00
20 T	Methylene Chloride	50.000	62.244	-24.5#	156	0.00
21 T	trans-1,2-Dichloroethene	50.000	54.426	-8.9	154	0.00
22 T	Diisopropyl ether	50.000	53.898	-7.8	104	0.00
23 T	Vinyl Acetate	250.000	250.230	-0.1	101	0.00
24 P	1,1-Dichloroethane	50.000	50.728	-1.5	107	0.00
25 T	2-Butanone	250.000	248.408	0.6	93	0.00
26 T	2,2-Dichloropropane	50.000	48.078	3.8	103	0.00
27 T	cis-1,2-Dichloroethene	50.000	51.495	-3.0	106	0.00
28 T	Bromochloromethane	50.000	50.720	-1.4	102	0.00
29 T	Tetrahydrofuran	250.000	263.793	-5.5	95	0.00
30 C	Chloroform	50.000	50.553	-1.1#	106	0.00
31 T	Cyclohexane	50.000	48.560	2.9	103	0.00
32 T	1,1,1-Trichloroethane	50.000	50.270	-0.5	107	0.00
33 S	1,2-Dichloroethane-d4	50.000	47.436	5.1	97	0.00
34 I	1,4-Difluorobenzene	50.000	50.000	0.0	106	0.00
35 S	Dibromofluoromethane	50.000	48.749	2.5	100	0.00
36 T	1,1-Dichloropropene	50.000	51.982	-4.0	106	0.00
37 T	Ethyl Acetate	50.000	54.416	-8.8	100	0.00
38 T	Carbon Tetrachloride	50.000	51.160	-2.3	105	0.00
39 T	Methylcyclohexane	50.000	52.489	-5.0	103	0.00
40 TM	Benzene	50.000	51.959	-3.9	106	0.00
41 T	Methacrylonitrile	50.000	59.853	-19.7	135	0.00
42 TM	1,2-Dichloroethane	50.000	52.939	-5.9	103	0.00
43 T	Isopropyl Acetate	50.000	51.805	-3.6	97	0.00
44 TM	Trichloroethene	50.000	50.880	-1.8	106	0.00
45 C	1,2-Dichloropropane	50.000	52.149	-4.3#	104	0.00

Data Path : Z:\voasrv\HPCHEM1\MSVOA D\Data\VD041520\
 Data File : VD065639.D
 Acq On : 15 Apr 2020 17:51
 Operator : VA/SY
 Sample : VSTDICV050
 Misc : 5.00G/5.00ml/MSVOA D/SOIL
 ALS Vial : 11 Sample Multiplier: 1

Instrument :
 MSVOA_D
 ClientSampled :
 ICVVD041520

Quant Time: Apr 16 04:01:11 2020
 Quant Method : Z:\VOASRV\HPCHEM1\MSVOA_D\METHOD\82D041520S.M
 Quant Title : SW846 8260
 QLast Update : Wed Apr 15 19:43:39 2020
 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
46 T	Dibromomethane	50.000	52.947	-5.9	103	0.00
47 T	Bromodichloromethane	50.000	52.733	-5.5	104	0.00
48 T	Methyl methacrylate	50.000	47.561	4.9	90	0.00
49 T	1,4-Dioxane	1000.000	978.330	2.2	94	0.00
50 S	Toluene-d8	50.000	49.127	1.7	100	0.00
51 T	4-Methyl-2-Pentanone	250.000	248.409	0.6	97	0.00
52 CM	Toluene	50.000	53.637	-7.3#	106	0.00
53 T	t-1,3-Dichloropropene	50.000	52.748	-5.5	99	0.00
54 T	cis-1,3-Dichloropropene	50.000	53.054	-6.1	102	0.00
55 T	1,1,2-Trichloroethane	50.000	52.054	-4.1	100	0.00
56 T	Ethyl methacrylate	50.000	48.581	2.8	99	0.00
57 T	1,3-Dichloropropane	50.000	52.884	-5.8	102	0.00
58 T	2-Chloroethyl Vinyl ether	250.000	239.040	4.4	97	0.00
59 T	2-Hexanone	250.000	244.430	2.2	94	0.00
60 T	Dibromochloromethane	50.000	52.817	-5.6	102	0.00
61 T	1,2-Dibromoethane	50.000	52.260	-4.5	100	0.00
62 S	4-Bromofluorobenzene	50.000	48.508	3.0	96	0.00
63 I	Chlorobenzene-d5	50.000	50.000	0.0	104	0.00
64 T	Tetrachloroethene	50.000	50.758	-1.5	104	0.00
65 PM	Chlorobenzene	50.000	52.010	-4.0	106	0.00
66 T	1,1,1,2-Tetrachloroethane	50.000	51.151	-2.3	104	0.00
67 C	Ethyl Benzene	50.000	52.984	-6.0#	105	0.00
68 T	m/p-Xylenes	100.000	108.534	-8.5	106	0.00
69 T	o-Xylene	50.000	54.266	-8.5	105	0.00
70 T	Styrene	50.000	55.891	-11.8	105	0.00
71 P	Bromoform	50.000	51.958	-3.9	101	0.00
72 I	1,4-Dichlorobenzene-d4	50.000	50.000	0.0	104	0.00
73 T	Isopropylbenzene	50.000	54.092	-8.2	105	0.00
74 T	N-amyl acetate	50.000	48.281	3.4	97	0.00
75 P	1,1,2,2-Tetrachloroethane	50.000	51.171	-2.3	99	0.00
76 T	1,2,3-Trichloropropane	50.000	55.459	-10.9	99	0.00
77 T	Bromobenzene	50.000	51.844	-3.7	102	0.00
78 T	n-propylbenzene	50.000	53.516	-7.0	104	0.00
79 T	2-Chlorotoluene	50.000	53.500	-7.0	106	0.00
80 T	1,3,5-Trimethylbenzene	50.000	53.649	-7.3	102	0.00
81 T	trans-1,4-Dichloro-2-butene	50.000	52.243	-4.5	97	0.00
82 T	4-Chlorotoluene	50.000	52.223	-4.4	103	0.00
83 T	tert-Butylbenzene	50.000	53.540	-7.1	103	0.00
84 T	1,2,4-Trimethylbenzene	50.000	54.751	-9.5	104	0.00
85 T	sec-Butylbenzene	50.000	53.416	-6.8	104	0.00
86 T	p-Isopropyltoluene	50.000	53.705	-7.4	104	0.00
87 T	1,3-Dichlorobenzene	50.000	51.636	-3.3	104	0.00
88 T	1,4-Dichlorobenzene	50.000	50.953	-1.9	102	0.00
89 T	n-Butylbenzene	50.000	53.437	-6.9	104	0.00

Data Path : Z:\voasrv\HPCHEM1\MSVOA D\Data\VD041520\
 Data File : VD065639.D
 Acq On : 15 Apr 2020 17:51
 Operator : VA/SY
 Sample : VSTDICV050
 Misc : 5.00G/5.00ml/MSVOA D/SOIL
 ALS Vial : 11 Sample Multiplier: 1

Instrument :
 MSVOA_D
 ClientSampleId :
 ICVVD041520

Quant Time: Apr 16 04:01:11 2020
 Quant Method : Z:\VOASRV\HPCHEM1\MSVOA_D\METHOD\82D041520S.M
 Quant Title : SW846 8260
 QLast Update : Wed Apr 15 19:43:39 2020
 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
90 T	Hexachloroethane	50.000	50.314	-0.6	104	0.00
91 T	1,2-Dichlorobenzene	50.000	52.097	-4.2	103	0.00
92 T	1,2-Dibromo-3-Chloropropane	50.000	50.383	-0.8	96	0.00
93 T	1,2,4-Trichlorobenzene	50.000	52.619	-5.2	101	0.00
94 T	Hexachlorobutadiene	50.000	51.220	-2.4	103	0.00
95 T	Naphthalene	50.000	47.237	5.5	95	0.00
96 T	1,2,3-Trichlorobenzene	50.000	52.621	-5.2	98	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 6

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CHEMTECH Contract: TETRO6
 Lab Code: CHEM Case No.: L2337 SAS No.: L2337 SDG No.: L2337
 Instrument ID: MSVOA_D Calibration Date/Time: 04/17/2020 13:16
 Lab File ID: VD065641.D Init. Calib. Date(s): 04/15/2020 04/15/2020
 Heated Purge: (Y/N) Y Init. Calib. Time(s): 14:09 16:28
 GC Column: RTX-VMS ID: 0.18 (mm)

COMPOUND	RRF	RRF050	MIN RRF	%D	MAX%D
Dichlorodifluoromethane	0.416	0.397		-4.57	20
Chloromethane	0.454	0.397	0.1	-12.56	20
Vinyl Chloride	0.494	0.463		-6.28	20
Bromomethane	0.268	0.256		-4.48	20
Chloroethane	0.293	0.269		-8.19	20
Trichlorofluoromethane	0.704	0.620		-11.93	20
1,1,2-Trichlorotrifluoroethane	0.321	0.296		-7.79	20
1,1-Dichloroethene	0.288	0.264		-8.33	20
Acetone	0.061	0.072		18.03	20
Carbon Disulfide	1.114	1.341		20.38	20
Methyl tert-butyl Ether	0.817	0.754		-7.71	20
Methylene Chloride	0.460	0.420		-8.7	20
trans-1,2-Dichloroethene	0.466	0.448		-3.86	20
1,1-Dichloroethane	0.841	0.739	0.1	-12.13	20
2-Butanone	0.114	0.105		-7.89	20
Carbon Tetrachloride	0.517	0.475		-8.12	20
cis-1,2-Dichloroethene	0.517	0.457		-11.6	20
Chloroform	0.861	0.731		-15.1	20
1,1,1-Trichloroethane	0.774	0.687		-11.24	20
Methylcyclohexane	0.562	0.544		-3.2	20
Benzene	1.388	1.242		-10.52	20
1,2-Dichloroethane	0.380	0.337		-11.32	20
Trichloroethene	0.389	0.351		-9.77	20
1,2-Dichloropropane	0.341	0.306		-10.26	20
Bromodichloromethane	0.469	0.407		-13.22	20
4-Methyl-2-Pentanone	0.176	0.158		-10.23	20
Toluene	0.856	0.798		-6.78	20
t-1,3-Dichloropropene	0.431	0.375		-12.99	20
cis-1,3-Dichloropropene	0.521	0.465		-10.75	20
1,1,2-Trichloroethane	0.249	0.212		-14.86	20
2-Hexanone	0.120	0.115		-4.17	20
Dibromochloromethane	0.328	0.283		-13.72	20
Tetrachloroethene	0.359	0.330		-8.08	20
Chlorobenzene	0.990	0.908	0.3	-8.38	20
Ethyl Benzene	1.692	1.614		-4.61	20
m/p-Xylenes	0.654	0.641		-1.99	20
o-Xylene	0.573	0.550		-4.01	20
Styrene	1.015	0.990		-2.46	20
Bromoform	0.213	0.188	0.1	-11.74	20

All other compounds must meet a minimum RRF of 0.010.
 RRF of 1,4-Dioxane = Value should be divide by 1000.

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CHEMTECH Contract: TETRO6
 Lab Code: CHEM Case No.: L2337 SAS No.: L2337 SDG No.: L2337
 Instrument ID: MSVOA_D Calibration Date/Time: 04/17/2020 13:16
 Lab File ID: VD065641.D Init. Calib. Date(s): 04/15/2020 04/15/2020
 Heated Purge: (Y/N) Y Init. Calib. Time(s): 14:09 16:28
 GC Column: RTX-VMS ID: 0.18 (mm)

COMPOUND	RRF	RRF050	MIN RRF	%D	MAX%D
Isopropylbenzene	3.016	2.987		-0.96	20
1,1,2,2-Tetrachloroethane	0.548	0.473	0.3	-13.69	20
1,3-Dichlorobenzene	1.568	1.422		-9.31	20
1,4-Dichlorobenzene	1.561	1.411		-9.61	20
1,2-Dichlorobenzene	1.344	1.208		-10.12	20
1,2-Dichloroethane-d4	0.425	0.358		-15.77	20
Dibromofluoromethane	0.311	0.274		-11.9	20
Toluene-d8	1.147	1.063		-7.32	20
4-Bromofluorobenzene	0.382	0.340		-10.99	20

All other compounds must meet a minimum RRF of 0.010.
 RRF of 1,4-Dioxane = Value should be divide by 1000.

Laboratory Control Sample/Laboratory Control Sample Duplicate Summary
SW-846

SDG No.: L2337
 Client: Tetra Tech NUS, Inc.
 Analytical Method: SW8260C Datafile : VD065656.D

Lab Sample ID	Parameter	Spike	Result	Unit	Rec	RPD	Qual	Low	Limits	
									High	RPD
VD0417SBS01	Dichlorodifluoromethane	17.7	14.6	ug/Kg	82			29	149	
	Chloromethane	17.7	16.4	ug/Kg	93			50	136	
	Vinyl chloride	17.7	17.0	ug/Kg	96			56	135	
	Bromomethane	17.7	19.7	ug/Kg	111			53	143	
	Chloroethane	17.7	17.3	ug/Kg	98			59	139	
	Trichlorofluoromethane	17.7	16.9	ug/Kg	95			62	140	
	1,1,2-Trichlorotrifluoroethane	17.7	17.5	ug/Kg	99			66	136	
	1,1-Dichloroethene	17.7	16.9	ug/Kg	95			70	131	
	Acetone	88.5	91.5	ug/Kg	103			36	164	
	Carbon disulfide	17.7	20.2	ug/Kg	114			63	132	
	Methyl tert-butyl Ether	17.7	18.9	ug/Kg	107			73	125	
	Methylene Chloride	17.7	27.5	ug/Kg	155		*	70	128	
	trans-1,2-Dichloroethene	17.7	18.2	ug/Kg	103			74	125	
	1,1-Dichloroethane	17.7	17.7	ug/Kg	100			76	125	
	2-Butanone	88.5	94.6	ug/Kg	107			51	148	
	Carbon Tetrachloride	17.7	16.5	ug/Kg	93			70	135	
	cis-1,2-Dichloroethene	17.7	17.2	ug/Kg	97			77	123	
	Chloroform	17.7	18.0	ug/Kg	102			78	123	
	1,1,1-Trichloroethane	17.7	17.3	ug/Kg	98			73	130	
	Methylcyclohexane	17.7	14.6	ug/Kg	82			66	133	
	Benzene	17.7	16.6	ug/Kg	94			77	121	
	1,2-Dichloroethane	17.7	18.4	ug/Kg	104			73	128	
	Trichloroethene	17.7	16.0	ug/Kg	90			77	123	
	1,2-Dichloropropane	17.7	17.2	ug/Kg	97			76	123	
	Bromodichloromethane	17.7	17.8	ug/Kg	101			75	127	
	4-Methyl-2-Pentanone	88.5	87.7	ug/Kg	99			65	135	
	Toluene	17.7	17.4	ug/Kg	98			77	121	
	t-1,3-Dichloropropene	17.7	16.9	ug/Kg	95			71	130	
	cis-1,3-Dichloropropene	17.7	16.9	ug/Kg	95			74	126	
	1,1,2-Trichloroethane	17.7	18.8	ug/Kg	106			78	121	
	2-Hexanone	88.5	86.1	ug/Kg	97			53	145	
	Dibromochloromethane	17.7	18.1	ug/Kg	102			74	126	
	Tetrachloroethene	17.7	15.9	ug/Kg	90			73	128	
	Chlorobenzene	17.7	16.9	ug/Kg	95			79	120	
	Ethyl Benzene	17.7	15.9	ug/Kg	90			76	122	
	m/p-Xylenes	35.4	32.1	ug/Kg	91			77	124	
	o-Xylene	17.7	16.0	ug/Kg	90			77	123	
	Styrene	17.7	16.7	ug/Kg	94			76	124	
	Bromoform	17.7	16.9	ug/Kg	95			67	132	
	Isopropylbenzene	17.7	15.0	ug/Kg	85			68	134	
	1,1,2,2-Tetrachloroethane	17.7	18.1	ug/Kg	102			70	124	
	1,3-Dichlorobenzene	17.7	15.5	ug/Kg	88			77	121	
	1,4-Dichlorobenzene	17.7	16.1	ug/Kg	91			75	120	
	1,2-Dichlorobenzene	17.7	16.8	ug/Kg	95			78	121	

Laboratory Control Sample/Laboratory Control Sample Duplicate Summary
SW-846

SDG No.: L2337
 Client: Tetra Tech NUS, Inc.
 Analytical Method: SW8260C

Datafile : VD065657.D

Lab Sample ID	Parameter	Spike	Result	Unit	Rec	RPD	Qual	Low	Limits	
									High	RPD
VD0417SBSD01	Dichlorodifluoromethane	17.7	14.4	ug/Kg	81	8		29	149	20
	Chloromethane	17.7	15.7	ug/Kg	89	5		50	136	20
	Vinyl chloride	17.7	15.9	ug/Kg	90	7		56	135	20
	Bromomethane	17.7	19.6	ug/Kg	111	5		53	143	20
	Chloroethane	17.7	17.3	ug/Kg	98	1		59	139	20
	Trichlorofluoromethane	17.7	16.5	ug/Kg	93	4		62	140	20
	1,1,2-Trichlorotrifluoroethane	17.7	16.9	ug/Kg	95	40	*	66	136	20
	1,1-Dichloroethene	17.7	16.1	ug/Kg	91	46	*	70	131	20
	Acetone	88.5	84.1	ug/Kg	95	45	*	36	164	20
	Carbon disulfide	17.7	16.3	ug/Kg	92	33	*	63	132	20
	Methyl tert-butyl Ether	17.7	13.5	ug/Kg	76	26	*	73	125	20
	Methylene Chloride	17.7	18.5	ug/Kg	105	23	*	70	128	20
	trans-1,2-Dichloroethene	17.7	12.4	ug/Kg	70	38	* *	74	125	20
	1,1-Dichloroethane	17.7	16.9	ug/Kg	95	2		76	125	20
	2-Butanone	88.5	89.3	ug/Kg	101	1		51	148	20
	Carbon Tetrachloride	17.7	16.0	ug/Kg	90	10		70	135	20
	cis-1,2-Dichloroethene	17.7	17.2	ug/Kg	97	3		77	123	20
	Chloroform	17.7	18.2	ug/Kg	103	6		78	123	20
	1,1,1-Trichloroethane	17.7	17.0	ug/Kg	96	3		73	130	20
	Methylcyclohexane	17.7	14.3	ug/Kg	81	13		66	133	20
	Benzene	17.7	16.6	ug/Kg	94	1		77	121	20
	1,2-Dichloroethane	17.7	17.7	ug/Kg	100	2		73	128	20
	Trichloroethene	17.7	15.9	ug/Kg	90	6		77	123	20
	1,2-Dichloropropane	17.7	17.1	ug/Kg	97	1		76	123	20
	Bromodichloromethane	17.7	17.0	ug/Kg	96	2		75	127	20
	4-Methyl-2-Pentanone	88.5	85.9	ug/Kg	97	5		65	135	20
	Toluene	17.7	17.2	ug/Kg	97	3		77	121	20
	t-1,3-Dichloropropene	17.7	16.2	ug/Kg	92	3		71	130	20
	cis-1,3-Dichloropropene	17.7	16.9	ug/Kg	95	7		74	126	20
	1,1,2-Trichloroethane	17.7	18.1	ug/Kg	102	6		78	121	20
	2-Hexanone	88.5	85.5	ug/Kg	97	2		53	145	20
	Dibromochloromethane	17.7	17.3	ug/Kg	98	1		74	126	20
	Tetrachloroethene	17.7	16.0	ug/Kg	90	7		73	128	20
	Chlorobenzene	17.7	16.7	ug/Kg	94	4		79	120	20
	Ethyl Benzene	17.7	15.6	ug/Kg	88	11		76	122	20
	m/p-Xylenes	35.4	32.5	ug/Kg	92	9		77	124	20
	o-Xylene	17.7	15.9	ug/Kg	90	3		77	123	20
	Styrene	17.7	16.6	ug/Kg	94	3		76	124	20
	Bromoform	17.7	16.8	ug/Kg	95	3		67	132	20
	Isopropylbenzene	17.7	14.7	ug/Kg	83	13		68	134	20
	1,1,2,2-Tetrachloroethane	17.7	17.6	ug/Kg	99	0		70	124	20
	1,3-Dichlorobenzene	17.7	15.8	ug/Kg	89	8		77	121	20
	1,4-Dichlorobenzene	17.7	16.4	ug/Kg	93	3		75	120	20
	1,2-Dichlorobenzene	17.7	16.4	ug/Kg	93	1		78	121	20

V@Áæ^Ác}á}á^Á-á|á\Á

Appendix C

Support Documents

B. Chain of Custody (COC)

V@Áæ^Ác}á}á^Á-á|á\Á

COC Number:

CLIENT INFORMATION		PROJECT INFORMATION		BILLING INFORMATION	
COMPANY: Tetra Tech		PROJECT NAME: NWIRP Bethpage		BILL TO: SEE CONTRACT PO#	
ADDRESS: 5700 Lake Wright Dr., Suite 102		PROJECT #: 112G08005-WE13 LOCATION: VPB-180		ADDRESS:	
CITY: Norfolk	STATE: VA ZIP: 23502	PROJECT MANAGER: Dave Brayack		CITY:	STATE: ZIP:
ATTENTION: Dave Brayack		E-MAIL: david.brayack@tetratech.com		ATTENTION: PHONE:	
PHONE: 757-466-4909 FAX: 757-461-4148		PHONE: 757-466-4909 FAX: 757-461-4148			

DATA TURNAROUND INFORMATION		DATA DELIVERABLE INFORMATION		ANALYSIS									COMMENTS
FAX: _____ 2 _____ DAYS*		<input type="checkbox"/> RESEULTS ONLY <input type="checkbox"/> USEPA CLP <input type="checkbox"/> RESULTS + QC <input type="checkbox"/> New York State ASP "B" <input type="checkbox"/> New Jersey REDUCED <input type="checkbox"/> New York State ASP "A" <input type="checkbox"/> New Jersey CLP <input type="checkbox"/> Other _____ <input type="checkbox"/> EDD Format _____		VOC(SW846-8260B)									
HARD COPY: _____ 2 _____ DAYS*				1 2 3 4 5 6 7 8 9									
EDD _____ 2 _____ DAYS*													
* TO BE APPROVED BY CHEMTECH STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS													

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# of Bottles	PRESERVATIVES									COMMENTS							
			COMP	GRAB	DATE	TIME		A	1	2	3	4	5	6	7	8		9						
1.	BP-VPB180-TB-20200414	AQ		X	4/14/20	9:00	2	2																
2.	BP-VPB180-GW-363-365	AQ		X	4/14/20	10:45	2	2																
3.	BP-VPB180-GW-378-380	AQ		X	4/14/20	12:42	2	2																
4.	BP-VPB180-GW-403-405	AQ		X	4/15/20	9:53	6	6																MS/MSD
5.	BP-VPB180-GW-418-420	AQ		X	4/15/20	12:04	2	2																
6.	BP-VPB180-GW-438-440	AQ		X	4/15/20	14:08	2	2																
7.	BP-VPB180-GW-458-460	AQ		X	4/16/20	10:00	2	2																
8.	BP-VPB180-EB-20200416	AQ		X	4/16/20	11:15	2	2																
9.	BP-VPB180-GW-483-485	AQ		X	4/16/20	13:50	2	2																
10.	BP-VPB180-DUP-20200416	AQ		X	4/16/20	11:00	2	2																

43677

RELINQUISHED BY SAMPLER	DATE/TIME	RECEIVED BY	Conditions of bottles or coolers at receipt: <input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Cooler Temp <u>2-6°C</u> MeOH extraction requires an additional 4oz. Jar for percent solid <input type="checkbox"/> Ice in Cooler?: <input checked="" type="checkbox"/> Comments: 48hr TAT - For VOC's see worksheet #15 of SAP 2018 for VPB program VOC list
1. <i>[Signature]</i>	4/16/20 16:50	1. <i>[Signature]</i>	
RELINQUISHED BY	DATE/TIME	RECEIVED BY	
2. <i>FedEx</i>	4-17-2020 0940	2. <i>[Signature]</i>	
RELINQUISHED BY	DATE/TIME	RECEIVED FOR LAB BY	
3. _____		3. _____	

Page 1 of 1

SHIPPED VIA: CLIENT: Hand Delivered Overnight
CHEMTECH: Picked Up Overnight

Shipment Complete
 YES NO

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

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Appendix C

Support Documents

C. Calculations for Stage 4 Data Validation

V@Áæ^Ác}á}á^Á-á|á\Á

SDG L2337

Verification calculations follow the written formula with the verification results compared to the reported value, verification value vs. reported value.

VOC (8260) SAMPLE QUANTITATION

carbon disulfide for BP-VPB180-GW-483-485

$$\text{Cpd. Concentration} = \frac{(\text{Area}_c)(\text{Conc}_{istd})(V_f)(DL)}{(\text{Area}_{st})(RRF_c)(V_i)}$$

Calc. Concentration = 0.87

AREA c	AREA st	CONC istd	RRF	Vf	Vi	DL
5026	194040	50	1.495	5000	5000	1

Reported Concentration = 0.87

VALIDATA

Chemical Services, Inc.

2159 Wynnton Pointe, Duluth, GA 30097

(770) 232-0130

(770) 232-5082 (Fax)

www.datavalidator.com

DATA VALIDATION SUMMARY REPORT - CHEMISTRY

COMPANY: Tetra Tech, Inc., Norfolk, VA
PROJECT NAME: Basewide Groundwater Investigation, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, N62470-16-D-9008
SITE NAME: CTO-WE13
CONTRACTED LAB: CHEMTECH, Mountainside, NJ
JOB NO./ACCOUNTING CODE: 112G08005-WE13
QA/QC LEVEL: EPA Stage 4
ANALYTICAL METHOD(S): SW846 Methods 8260C
VALIDATION GUIDELINES: Tier II Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Installation Program Site 0001 – Former Drum Marshalling Area Operable Unit 2 Plume Naval Weapons Industrial Reserve Plant Bethpage, New York, March 2019, DOD QSM 5.0; July 2013, DOD Data Validation Guidance, February 2018, Method criteria, Laboratory limits and Professional Judgment
SAMPLE MATRICES: Soil and Groundwater
TYPES OF ANALYSES: Volatile Organic Compounds (VOC)
DATA VALIDATION DATE: June 16, 2020
DATA REVIEWER(S): Amy L. Hogan
SDG NUMBER: L2386
SAMPLING DATE(S): April 17-21, 2020

SAMPLES:

<u>Client Sample ID</u>	<u>Laboratory ID</u>	<u>VOC</u>
BP-VPB180-TB-20200417	L2336-01	X
BP-VPB180-GW-498-500	L2386-02	X
BP-VPB180-GW-538-540	L2386-04	X
BP-VPB180-GW-558-560	L2386-05	X
BP-VPB180-GW-518-520	L2386-06	X

Suffix Codes: DL= DILUTION, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA VALIDATION SUMMARY

CHEMTECH – SDG: L2386 – Organic Chemistry

VOLATILE ORGANICS

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW846 Method 8260C.

II.) Overall Assessment of Data:

All laboratory data were acceptable with qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No data qualification was necessary.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks for this SDG. No data qualification was necessary.

Equipment and Rinsate Blanks:

There was no associated equipment blank for this SDG. No data qualification was necessary.

Field Blank:

There were no associated field blanks for this SDG. No data qualification was necessary.

Trip Blank:

Acetone (1.40 ug/L) was detected in associated trip blank BP-VPB180-TB-20200417. Since the blank concentration was less than the LOQ, all positive acetone results for the samples, which were less than the LOQ, were qualified as undetected (U) with the result being raised to the LOQ and reason code B.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS and one LCS / LCSD set were analyzed by the laboratory for this SDG. All criteria were met. No data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

Batch MS / MSD analyses data were submitted for this SDG. A total of six Percent Recoveries (%Rs) and one Relative Percent Difference (RPD) were outside the QC limits. Data qualification based on batch MS / MSD data was not required. No data qualification was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples identified as part of this SDG. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All forty-three requested compounds for groundwater samples and all forty-four requested compounds for soil samples were reported with acceptable LOD and LOQ results as determined by the SAP.

The validator has noted that the non-detect results for the following compounds were reported at the LOD, which exceeds the PAL limit of 0.17 ug/L for the groundwater samples : carbon disulfide, carbon tetrachloride, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene , 1,1,2,2-tetrachloroethane, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene and 1,1,2-trichlorotrifluoroethane.

The validator has noted that the non-detect results for vinyl chloride in all groundwater samples were reported at the LOD, which exceeds the PAL limit of 0.67 ug/L.

XII.) Sample Calculation Verification (Stage 4):

No discrepancies were noted in the sample calculation verification process.

Appendix A

Data Qualification Summary Table (DQST) with Qualification Codes

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DATA QUALIFICATION SUMMARY TABLE (DQST) WITH QUALIFICATION CODES

VOC								
Client Sample ID	Date Collected	Lab Sample ID	Analyte	Lab Qual	Val Result	VAL_RES ERROR	Val Qual	Val Reason
BP-VPB180-GW-498-500	4/17/2020 0:00	L2386-02	ACETONE	J	4.3	25.0	U	B
BP-VPB180-GW-538-540	4/21/2020 0:00	L2386-04	ACETONE	J	5.4	25.0	U	B
BP-VPB180-GW-558-560	4/21/2020 0:00	L2386-05	ACETONE	J	4.5	25.0	U	B

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Appendix B

Laboratory Sample Results

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/17/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-TB-20200417	SDG No.:	L2386
Lab Sample ID:	L2386-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061161.D	1		04/28/20 14:08	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	1.40	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/17/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-TB-20200417	SDG No.:	L2386
Lab Sample ID:	L2386-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061161.D	1		04/28/20 14:08	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	49.7		81 - 118		99%	SPK: 50
1868-53-7	Dibromofluoromethane	51.7		80 - 119		103%	SPK: 50
2037-26-5	Toluene-d8	51.1		89 - 112		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.9		85 - 114		104%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	109000	7.63				
540-36-3	1,4-Difluorobenzene	193000	8.55				
3114-55-4	Chlorobenzene-d5	184000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	80000	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/17/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-GW-498-500	SDG No.:	L2386
Lab Sample ID:	L2386-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061164.D	1		04/28/20 15:18	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	4.30	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/17/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-GW-498-500	SDG No.:	L2386
Lab Sample ID:	L2386-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061164.D	1		04/28/20 15:18	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	51.5		81 - 118		103%	SPK: 50
1868-53-7	Dibromofluoromethane	51.2		80 - 119		102%	SPK: 50
2037-26-5	Toluene-d8	51.4		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.5		85 - 114		105%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	104000	7.63				
540-36-3	1,4-Difluorobenzene	185000	8.55				
3114-55-4	Chlorobenzene-d5	180000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	80600	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/21/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-GW-538-540	SDG No.:	L2386
Lab Sample ID:	L2386-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061165.D	1		04/28/20 15:41	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	5.40	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/21/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-GW-538-540	SDG No.:	L2386
Lab Sample ID:	L2386-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061165.D	1		04/28/20 15:41	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	50.5		81 - 118		101%	SPK: 50
1868-53-7	Dibromofluoromethane	52.0		80 - 119		104%	SPK: 50
2037-26-5	Toluene-d8	51.2		89 - 112		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.2		85 - 114		102%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	102000	7.63				
540-36-3	1,4-Difluorobenzene	183000	8.55				
3114-55-4	Chlorobenzene-d5	175000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	78900	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 E = Value Exceeds Calibration Range
 Q = indicates LCS control criteria did not meet requirements
 M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 N = Presumptive Evidence of a Compound
 * = Values outside of QC limits
 D = Dilution
 () = Laboratory InHouse Limit
 A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/21/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-GW-558-560	SDG No.:	L2386
Lab Sample ID:	L2386-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061163.D	1		04/28/20 14:54	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	4.50	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	2.20	J	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/21/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-GW-558-560	SDG No.:	L2386
Lab Sample ID:	L2386-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061163.D	1		04/28/20 14:54	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	50.8		81 - 118		102%	SPK: 50
1868-53-7	Dibromofluoromethane	51.0		80 - 119		102%	SPK: 50
2037-26-5	Toluene-d8	51.3		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.9		85 - 114		104%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	106000	7.63				
540-36-3	1,4-Difluorobenzene	191000	8.55				
3114-55-4	Chlorobenzene-d5	184000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	82200	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/20/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-GW-518-520	SDG No.:	L2386
Lab Sample ID:	L2386-06	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	98.1
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VW015311.D	1		04/22/20 16:29	VW042220

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	130	U	77.1	130	260	ug/Kg
74-87-3	Chloromethane	210	U	120	210	260	ug/Kg
75-01-4	Vinyl Chloride	130	U	72.8	130	260	ug/Kg
74-83-9	Bromomethane	130	U	68.6	130	260	ug/Kg
75-00-3	Chloroethane	130	U	86.4	130	260	ug/Kg
75-69-4	Trichlorofluoromethane	130	U	78.7	130	260	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	130	U	86.5	130	260	ug/Kg
75-35-4	1,1-Dichloroethene	130	U	74.8	130	260	ug/Kg
67-64-1	Acetone	1100	U	320	1100	1300	ug/Kg
75-15-0	Carbon Disulfide	130	U	51.3	130	260	ug/Kg
1634-04-4	Methyl tert-butyl Ether	210	U	74.6	210	260	ug/Kg
75-09-2	Methylene Chloride	420	U	300	420	530	ug/Kg
156-60-5	trans-1,2-Dichloroethene	210	U	83.6	210	260	ug/Kg
75-34-3	1,1-Dichloroethane	130	U	49.6	130	260	ug/Kg
78-93-3	2-Butanone	1100	U	440	1100	1300	ug/Kg
56-23-5	Carbon Tetrachloride	130	U	46.8	130	260	ug/Kg
156-59-2	cis-1,2-Dichloroethene	130	U	73.3	130	260	ug/Kg
67-66-3	Chloroform	130	U	67.1	130	260	ug/Kg
71-55-6	1,1,1-Trichloroethane	130	U	40.1	130	260	ug/Kg
108-87-2	Methylcyclohexane	130	U	24.3	130	260	ug/Kg
71-43-2	Benzene	130	U	44.9	130	260	ug/Kg
107-06-2	1,2-Dichloroethane	130	U	47.9	130	260	ug/Kg
79-01-6	Trichloroethene	130	U	44.7	130	260	ug/Kg
78-87-5	1,2-Dichloropropane	130	U	46.5	130	260	ug/Kg
75-27-4	Bromodichloromethane	130	U	47.4	130	260	ug/Kg
108-10-1	4-Methyl-2-Pentanone	660	U	370	660	1300	ug/Kg
108-88-3	Toluene	130	U	45.2	130	260	ug/Kg
10061-02-6	t-1,3-Dichloropropene	130	U	56.6	130	260	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	130	U	51.6	130	260	ug/Kg
79-00-5	1,1,2-Trichloroethane	210	U	52.3	210	260	ug/Kg
591-78-6	2-Hexanone	1100	U	460	1100	1300	ug/Kg
124-48-1	Dibromochloromethane	130	U	55.9	130	260	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/20/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-GW-518-520	SDG No.:	L2386
Lab Sample ID:	L2386-06	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	98.1
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VW015311.D	1		04/22/20 16:29	VW042220

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	130	U	45.9	130	260	ug/Kg
108-90-7	Chlorobenzene	130	U	47.1	130	260	ug/Kg
100-41-4	Ethyl Benzene	130	U	54.4	130	260	ug/Kg
179601-23-1	m/p-Xylenes	260	U	110	260	530	ug/Kg
95-47-6	o-Xylene	130	U	52.4	130	260	ug/Kg
100-42-5	Styrene	130	U	72.6	130	260	ug/Kg
75-25-2	Bromoform	210	U	63.4	210	260	ug/Kg
98-82-8	Isopropylbenzene	130	U	59.8	130	260	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	130	U	56.1	130	260	ug/Kg
541-73-1	1,3-Dichlorobenzene	130	U	67.9	130	260	ug/Kg
106-46-7	1,4-Dichlorobenzene	130	U	44.8	130	260	ug/Kg
95-50-1	1,2-Dichlorobenzene	210	U	54.7	210	260	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	55.2		71 - 136		110%	SPK: 50
1868-53-7	Dibromofluoromethane	55.8		78 - 119		112%	SPK: 50
2037-26-5	Toluene-d8	51.3		85 - 116		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	44.6		79 - 119		89%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	212000	7.95				
540-36-3	1,4-Difluorobenzene	304000	8.84				
3114-55-4	Chlorobenzene-d5	272000	11.63				
3855-82-1	1,4-Dichlorobenzene-d4	120000	13.56				
TENTATIVE IDENTIFIED COMPOUNDS							
75-73-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

V@Áæ^Ác}á}á^Á-á|á\Á

Appendix C

Support Documents

A. Documents Supporting Qualifications

V@Áæ^Ác}á}á^Á-á|á\Á

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/17/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-TB-20200417	SDG No.:	L2386
Lab Sample ID:	L2386-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061161.D	1		04/28/20 14:08	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	1.40	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/17/20
Project:	CTO WE13	Date Received:	04/22/20
Client Sample ID:	BP-VPB180-TB-20200417	SDG No.:	L2386
Lab Sample ID:	L2386-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061161.D	1		04/28/20 14:08	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	49.7		81 - 118		99%	SPK: 50
1868-53-7	Dibromofluoromethane	51.7		80 - 119		103%	SPK: 50
2037-26-5	Toluene-d8	51.1		89 - 112		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.9		85 - 114		104%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	109000	7.63				
540-36-3	1,4-Difluorobenzene	193000	8.55				
3114-55-4	Chlorobenzene-d5	184000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	80000	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Matrix Spike/Matrix Spike Duplicate Summary
SW-846

SDG No.: L2386

Client: Tetra Tech NUS, Inc.

Analytical Method: SW8260-Low

Parameter	Spike	Sample Result	Result	Units	Rec			RPD		Limits		RPD
					Rec	Qual	RPD	Qual	Low	High		
Lab Sample ID :	L2414-07MS	Client Sample ID :	ST006RW149-200422MS			Datafile :		VN061176.D				
Chloromethane	50	0	50.8	ug/L	102				50	139		
Vinyl chloride	50	0	130	ug/L	260	*			58	137		
Bromomethane	50	0	49.2	ug/L	98				53	141		
Chloroethane	50	0	50.0	ug/L	100				60	138		
Trichlorofluoromethane	50	0	54.9	ug/L	110				65	141		
1,1,2-Trichlorotrifluoroethane	50	0	52.1	ug/L	104				70	136		
1,1-Dichloroethene	50	0	52.8	ug/L	106				71	131		
Acetone	250	0	240	ug/L	96				39	160		
Carbon disulfide	50	0	52.1	ug/L	104				64	133		
Methyl tert-butyl Ether	50	0	50.4	ug/L	101				71	124		
Methylene Chloride	50	0	51.0	ug/L	102				74	124		
trans-1,2-Dichloroethene	50	0	55.8	ug/L	112				75	124		
1,1-Dichloroethane	50	0	52.8	ug/L	106				77	125		
2-Butanone	250	0	250	ug/L	100				56	143		
Carbon Tetrachloride	50	0	58.0	ug/L	116				72	136		
cis-1,2-Dichloroethene	50	0	1000	ug/L	2000	*			78	123		
Chloroform	50	0	51.3	ug/L	103				79	124		
1,1,1-Trichloroethane	50	0	56.9	ug/L	114				74	131		
Methylcyclohexane	50	0	61.1	ug/L	122				72	132		
Benzene	50	0	51.3	ug/L	103				79	120		
1,2-Dichloroethane	50	0	52.3	ug/L	105				73	128		
Trichloroethene	50	0	58.2	ug/L	116				79	123		
1,2-Dichloropropane	50	0	51.1	ug/L	102				78	122		
Bromodichloromethane	50	0	54.0	ug/L	108				79	125		
4-Methyl-2-Pentanone	250	0	250	ug/L	100				67	130		
Toluene	50	0	53.4	ug/L	107				80	121		
t-1,3-Dichloropropene	50	0	52.3	ug/L	105				73	127		
cis-1,3-Dichloropropene	50	0	51.3	ug/L	103				75	124		
1,1,2-Trichloroethane	50	0	54.6	ug/L	109				80	119		
2-Hexanone	250	0	250	ug/L	100				57	139		
Dibromochloromethane	50	0	53.1	ug/L	106				74	126		
Tetrachloroethene	50	0	54.8	ug/L	110				74	129		
Chlorobenzene	50	0	52.3	ug/L	105				82	118		
Ethyl Benzene	50	0	53.3	ug/L	107				79	121		
m/p-Xylenes	100	0	110	ug/L	110				80	121		
o-Xylene	50	0	52.8	ug/L	106				78	122		
Styrene	50	0	54.0	ug/L	108				78	123		
Bromoform	50	0	54.4	ug/L	109				66	130		
Isopropylbenzene	50	0	51.1	ug/L	102				72	131		
1,1,2,2-Tetrachloroethane	50	0	50.5	ug/L	101				71	121		
1,3-Dichlorobenzene	50	0	51.2	ug/L	102				80	119		
1,4-Dichlorobenzene	50	0	50.2	ug/L	100				79	118		
1,2-Dichlorobenzene	50	0	51.0	ug/L	102				80	119		

**Matrix Spike/Matrix Spike Duplicate Summary
SW-846**

SDG No.: L2386

Client: Tetra Tech NUS, Inc.

Analytical Method: SW8260-Low

Parameter	Spike	Sample Result	Result	Units	Rec			RPD		Limits		RPD
					Rec	Qual	RPD	Qual	Low	High		
Lab Sample ID :	L2414-08MSD	Client Sample ID :	ST006RW149-200422MSD			Datafile :		VN061177.D				
Chloromethane	50	0	55.2	ug/L	110		8		50	139	20	
Vinyl chloride	50	0	140	ug/L	280	*	7		58	137	20	
Bromomethane	50	0	53.6	ug/L	107		9		53	141	20	
Chloroethane	50	0	52.8	ug/L	106		5		60	138	20	
Trichlorofluoromethane	50	0	56.8	ug/L	114		3		65	141	20	
1,1,2-Trichlorotrifluoroethane	50	0	53.1	ug/L	106		2		70	136	20	
1,1-Dichloroethene	50	0	56.0	ug/L	112		6		71	131	20	
Acetone	250	0	250	ug/L	100		4		39	160	20	
Carbon disulfide	50	0	55.6	ug/L	111		6		64	133	20	
Methyl tert-butyl Ether	50	0	53.7	ug/L	107		6		71	124	20	
Methylene Chloride	50	0	53.7	ug/L	107		5		74	124	20	
trans-1,2-Dichloroethene	50	0	58.6	ug/L	117		5		75	124	20	
1,1-Dichloroethane	50	0	55.6	ug/L	111		5		77	125	20	
2-Butanone	250	0	270	ug/L	108		8		56	143	20	
Carbon Tetrachloride	50	0	61.5	ug/L	123		6		72	136	20	
cis-1,2-Dichloroethene	50	0	1200	ug/L	2400	*	18		78	123	20	
Chloroform	50	0	53.9	ug/L	108		5		79	124	20	
1,1,1-Trichloroethane	50	0	59.7	ug/L	119		5		74	131	20	
Methylcyclohexane	50	0	63.2	ug/L	126		3		72	132	20	
Benzene	50	0	53.7	ug/L	107		5		79	120	20	
1,2-Dichloroethane	50	0	54.5	ug/L	109		4		73	128	20	
Trichloroethene	50	0	62.9	ug/L	126	*	8		79	123	20	
1,2-Dichloropropane	50	0	54.5	ug/L	109		6		78	122	20	
Bromodichloromethane	50	0	56.6	ug/L	113		5		79	125	20	
4-Methyl-2-Pentanone	250	0	260	ug/L	104		4		67	130	20	
Toluene	50	0	55.4	ug/L	111		4		80	121	20	
t-1,3-Dichloropropene	50	0	54.8	ug/L	110		5		73	127	20	
cis-1,3-Dichloropropene	50	0	53.6	ug/L	107		4		75	124	20	
1,1,2-Trichloroethane	50	0	67.3	ug/L	135	*	21	*	80	119	20	
2-Hexanone	250	0	260	ug/L	104		4		57	139	20	
Dibromochloromethane	50	0	56.6	ug/L	113		6		74	126	20	
Tetrachloroethene	50	0	56.7	ug/L	113		3		74	129	20	
Chlorobenzene	50	0	54.3	ug/L	109		4		82	118	20	
Ethyl Benzene	50	0	55.5	ug/L	111		4		79	121	20	
m/p-Xylenes	100	0	110	ug/L	110		0		80	121	20	
o-Xylene	50	0	55.4	ug/L	111		5		78	122	20	
Styrene	50	0	56.4	ug/L	113		4		78	123	20	
Bromoform	50	0	57.0	ug/L	114		5		66	130	20	
Isopropylbenzene	50	0	55.1	ug/L	110		8		72	131	20	
1,1,2,2-Tetrachloroethane	50	0	52.9	ug/L	106		5		71	121	20	
1,3-Dichlorobenzene	50	0	54.1	ug/L	108		6		80	119	20	
1,4-Dichlorobenzene	50	0	53.6	ug/L	107		7		79	118	20	
1,2-Dichlorobenzene	50	0	54.4	ug/L	109		6		80	119	20	

Appendix C

Support Documents

B. Chain of Custody (COC)

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CLIENT INFORMATION

COMPANY: Tetra Tech
ADDRESS: 5700 Lake Wright Dr., Suite 102
CITY: Norfolk STATE: VA ZIP: 23502
ATTENTION: Dave Brayack
PHONE: 757-466-4909 FAX: 757-461-4148

PROJECT INFORMATION

PROJECT NAME: NWIRP Bethpage
PROJECT #: 112G08005-WE13 LOCATION: VPB-180
PROJECT MANAGER: Dave Brayack
E-MAIL: david.brayack@tetrattech.com
PHONE: 757-466-4909 FAX: 757-461-4148

BILLING INFORMATION

BILL TO: SEE CONTRACT PO#
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: 2 DAYS*
HARD COPY: 2 DAYS*
EDD 2 DAYS*
* TO BE APPROVED BY CHEMTECH
STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

RESEULTS ONLY USEPA CLP
 RESULTS + QC New York State ASP "B"
 New Jersey REDUCED New York State ASP "A"
 New Jersey CLP Other _____
 EDD Format _____

ANALYSIS

VOC(SW846-8260B)	1	2	3	4	5	6	7	8	9

PRESERVATIVES

COMMENTS

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# of Bottles	PRESERVATIVES									COMMENTS		
			COMP	GRAB	DATE	TIME		A	1	2	3	4	5	6	7	8		9	
1.	BP-VPB180-TB-20200417	AQ		X	4/17/20	9:00	2	2											
2.	BP-VPB180-GW-498-500	AQ		X	4/17/20	9:55	2	2											
3.	BP-VPB180-GW-518-520	AQ		X	4/20/20	14:30	2	2											
4.	BP-VPB180-GW-538-540	AQ		X	4/21/20	10:15	6	6											Very turbid
5.	BP-VPB180-GW-558-560	AQ		X	4/21/20	12:13	2	2											
6.																			
7.																			
8.																			
9.																			
10.																			

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER <u>[Signature]</u>	DATE/TIME <u>4/21/20 15:30</u>	RECEIVED BY <u>[Signature]</u>	Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Cooler Temp <u>3.3</u> MeOH extraction requires an additional 4oz. Jar for percent solid <input type="checkbox"/> Ice in Cooler? <u>yes</u> Comments: 48hr TAT - For VOC's see worksheet #15 of SAP 2018 for VPB program VOC list
RELINQUISHED BY <u>[Signature]</u>	DATE/TIME <u>4-22-20 9:44</u>	RECEIVED BY <u>[Signature]</u>	
RELINQUISHED BY <u>[Signature]</u>	DATE/TIME <u></u>	RECEIVED FOR LAB BY <u>[Signature]</u>	

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Appendix C

Support Documents

C. Calculations for Stage 4 Data Validation

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SDG L2386

Verification calculations follow the written formula with the verification results compared to the reported value, verification value vs. reported value.

VOC (8260) SAMPLE QUANTITATION

LCS (soil) for toluene

$$\text{Cpd. Concentration} = \frac{(\text{Area}_c)(\text{Conc}_{istd})(V_f)(DL)}{(\text{Area}_{st})(RRF_c)(V_i)}$$

Calc. Concentration = 20.4

AREA c	AREA st	CONC istd	RRF	Vf	Vi	DL
112234	325155	50	0.844	5000	5000	1

Reported Concentration = 20.5

VALIDATA

Chemical Services, Inc.

2159 Wynnton Pointe, Duluth, GA 30097

(770) 232-0130

(770) 232-5082 (Fax)

www.datavalidator.com

DATA VALIDATION SUMMARY REPORT - CHEMISTRY

COMPANY: Tetra Tech, Inc., Norfolk, VA
PROJECT NAME: Basewide Groundwater Investigation, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, N62470-16-D-9008
SITE NAME: CTO-WE13
CONTRACTED LAB: CHEMTECH, Mountainside, NJ
JOB NO./ACCOUNTING CODE: 112G08005-WE13
QA/QC LEVEL: EPA Stage 4
ANALYTICAL METHOD(S): SW846 Methods 8260C
VALIDATION GUIDELINES: Tier II Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Installation Program Site 0001 – Former Drum Marshalling Area Operable Unit 2 Plume Naval Weapons Industrial Reserve Plant Bethpage, New York, March 2019, DOD QSM 5.0; July 2013, DOD Data Validation Guidance, February 2018, Method criteria, Laboratory limits and Professional Judgment
SAMPLE MATRICES: Soil and Groundwater
TYPES OF ANALYSES: Volatile Organic Compounds (VOC)
DATA VALIDATION DATE: June 16, 2020
DATA REVIEWER(S): Amy L. Hogan
SDG NUMBER: L2412
SAMPLING DATE(S): April 22-23, 2020

SAMPLES:

<u>Client Sample ID</u>	<u>Laboratory ID</u>	<u>VOC</u>
BP-VPB180-TB-20200422	L2412-01	X
BP-VPB180-GW-588-590	L2412-02	X
BP-VPB180-GW-588-590DL	L2412-02DL	X
BP-VPB180-GW-618-620	L2412-04	X
BP-VPB180-GW-DUP-20200423	L2412-05	X
BP-VPB180-GW-608-610	L2412-06	X

Suffix Codes: DL= DILUTION, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA VALIDATION SUMMARY

CHEMTECH – SDG: L2412 – Organic Chemistry

VOLATILE ORGANICS

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW846 Method 8260C.

II.) Overall Assessment of Data:

All laboratory data were acceptable with qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No data qualification was necessary.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks for this SDG. No data qualification was necessary.

Equipment and Rinsate Blanks:

There was no associated equipment blank for this SDG. No data qualification was necessary.

Field Blank:

There were no associated field blanks for this SDG. No data qualification was necessary.

Trip Blank:

There were no detections in associated trip blank BP-VPB180-TB-20200422. No data qualification was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

Two LCS and one LCS / LCSD set were analyzed by the laboratory for this SDG. All criteria were met. No data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

Batch MS / MSD analyses data were submitted for this SDG. A total of six Percent Recoveries (%Rs) and one Relative Percent Difference (RPD) were outside the QC limits. Data qualification based on batch MS / MSD data was not required. No data qualification was necessary.

VIII.) Field Duplicates:

One set of field duplicate samples (BP-VPB180-GW-618-620 / BP-VPB180-DUP-20200423) was identified as part of this SDG. The calculable difference for acetone was less than 2X the LOQ. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All forty-three requested compounds for groundwater samples and all forty-four requested compounds for soil samples were reported with acceptable LOD and LOQ results as determined by the SAP.

The validator has noted that the non-detect results for the following compounds were reported at the LOD, which exceeds the PAL limit of 0.17 ug/L for the groundwater samples : carbon disulfide, carbon tetrachloride, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene , 1,1,2,2-tetrachloroethane, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene and 1,1,2-trichlorotrifluoroethane.

The validator has noted that the non-detect results for vinyl chloride in all groundwater samples were reported at the LOD, which exceeds the PAL limit of 0.67 ug/L.

The result for trichloroethene in the initial analysis for sample BP-VPB180-GW-588-590 exceeded the linear calibration range. A dilution analysis was performed for the sample with all calibration criteria met. Citing the CRQL criteria and professional judgment, the validator has determined that the reanalysis result for the listed compound in the sample to be of preferable data quality to the initial analysis result and the initial analysis results for all other compounds in the samples to be of preferable data quality to the reanalysis results for the sample.

XII.) Sample Calculation Verification (Stage 4):

No discrepancies were noted in the sample calculation verification process.

Appendix A

Data Qualification Summary Table (DQST) with Qualification Codes

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DATA QUALIFICATION SUMMARY TABLE (DQST) WITH QUALIFICATION CODES

Client Sample ID	Lab Sample ID	Date Collected	Analyte	Lab Qual	Val Result	Val Qual	Val Reason
N/A	N/A	N/A	N/A	No qualifications were made			

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Appendix B

Laboratory Sample Results

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Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/22/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-TB-20200422	SDG No.:	L2412
Lab Sample ID:	L2412-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061162.D	1		04/28/20 14:31	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/22/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-TB-20200422	SDG No.:	L2412
Lab Sample ID:	L2412-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061162.D	1		04/28/20 14:31	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	50.5		81 - 118		101%	SPK: 50
1868-53-7	Dibromofluoromethane	51.6		80 - 119		103%	SPK: 50
2037-26-5	Toluene-d8	51.6		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.6		85 - 114		103%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	113000	7.63				
540-36-3	1,4-Difluorobenzene	201000	8.55				
3114-55-4	Chlorobenzene-d5	193000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	84800	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/22/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-GW-588-590	SDG No.:	L2412
Lab Sample ID:	L2412-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061166.D	1		04/28/20 16:04	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	6.10		0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	2.80	J	0.27	0.50	5.00	ug/L
67-64-1	Acetone	4.60	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	3.00	J	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	2.70	J	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	420	E	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	2.20	J	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/22/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-GW-588-590	SDG No.:	L2412
Lab Sample ID:	L2412-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061166.D	1		04/28/20 16:04	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	51.1		81 - 118		102%	SPK: 50
1868-53-7	Dibromofluoromethane	51.3		80 - 119		103%	SPK: 50
2037-26-5	Toluene-d8	51.7		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.1		85 - 114		104%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	100000	7.63				
540-36-3	1,4-Difluorobenzene	180000	8.55				
3114-55-4	Chlorobenzene-d5	174000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	78500	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 E = Value Exceeds Calibration Range
 Q = indicates LCS control criteria did not meet requirements
 M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 N = Presumptive Evidence of a Compound
 * = Values outside of QC limits
 D = Dilution
 () = Laboratory InHouse Limit
 A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/22/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-GW-588-590DL	SDG No.:	L2412
Lab Sample ID:	L2412-02DL	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061187.D	10		04/29/20 13:04	VN042920

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	5.00	UD	2.20	5.00	50.0	ug/L
75-01-4	Vinyl Chloride	5.00	UD	1.70	5.00	50.0	ug/L
74-83-9	Bromomethane	37.5	UD	11.3	37.5	50.0	ug/L
75-00-3	Chloroethane	5.00	UD	3.30	5.00	50.0	ug/L
75-69-4	Trichlorofluoromethane	5.00	UD	2.40	5.00	50.0	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	5.00	UD	1.90	5.00	50.0	ug/L
75-35-4	1,1-Dichloroethene	5.00	UD	2.70	5.00	50.0	ug/L
67-64-1	Acetone	25.0	UD	13.9	25.0	250	ug/L
75-15-0	Carbon Disulfide	5.00	UD	2.30	5.00	50.0	ug/L
1634-04-4	Methyl tert-butyl Ether	5.00	UD	1.90	5.00	50.0	ug/L
75-09-2	Methylene Chloride	5.00	UD	3.20	5.00	50.0	ug/L
156-60-5	trans-1,2-Dichloroethene	5.00	UD	1.40	5.00	50.0	ug/L
75-34-3	1,1-Dichloroethane	5.00	UD	1.50	5.00	50.0	ug/L
78-93-3	2-Butanone	25.0	UD	10.0	25.0	250	ug/L
56-23-5	Carbon Tetrachloride	5.00	UD	2.60	5.00	50.0	ug/L
156-59-2	cis-1,2-Dichloroethene	5.00	UD	2.40	5.00	50.0	ug/L
67-66-3	Chloroform	5.00	UD	1.90	5.00	50.0	ug/L
71-55-6	1,1,1-Trichloroethane	7.50	UD	1.50	7.50	50.0	ug/L
108-87-2	Methylcyclohexane	5.00	UD	1.10	5.00	50.0	ug/L
71-43-2	Benzene	5.00	UD	1.30	5.00	50.0	ug/L
107-06-2	1,2-Dichloroethane	7.50	UD	2.70	7.50	50.0	ug/L
79-01-6	Trichloroethene	400	D	1.30	5.00	50.0	ug/L
78-87-5	1,2-Dichloropropane	5.00	UD	1.10	5.00	50.0	ug/L
75-27-4	Bromodichloromethane	5.00	UD	1.10	5.00	50.0	ug/L
108-10-1	4-Methyl-2-Pentanone	25.0	UD	6.50	25.0	250	ug/L
108-88-3	Toluene	5.00	UD	2.00	5.00	50.0	ug/L
10061-02-6	t-1,3-Dichloropropene	5.00	UD	2.30	5.00	50.0	ug/L
10061-01-5	cis-1,3-Dichloropropene	5.00	UD	1.50	5.00	50.0	ug/L
79-00-5	1,1,2-Trichloroethane	5.00	UD	1.90	5.00	50.0	ug/L
591-78-6	2-Hexanone	37.5	UD	8.20	37.5	250	ug/L
124-48-1	Dibromochloromethane	5.00	UD	1.30	5.00	50.0	ug/L
127-18-4	Tetrachloroethene	5.00	UD	1.30	5.00	50.0	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/22/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-GW-588-590DL	SDG No.:	L2412
Lab Sample ID:	L2412-02DL	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061187.D	10		04/29/20 13:04	VN042920

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	5.00	UD	1.20	5.00	50.0	ug/L
100-41-4	Ethyl Benzene	5.00	UD	1.20	5.00	50.0	ug/L
179601-23-1	m/p-Xylenes	10.0	UD	2.50	10.0	100	ug/L
95-47-6	o-Xylene	5.00	UD	1.20	5.00	50.0	ug/L
100-42-5	Styrene	5.00	UD	1.60	5.00	50.0	ug/L
75-25-2	Bromoform	5.00	UD	1.80	5.00	50.0	ug/L
98-82-8	Isopropylbenzene	5.00	UD	2.10	5.00	50.0	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	5.00	UD	2.70	5.00	50.0	ug/L
541-73-1	1,3-Dichlorobenzene	5.00	UD	1.60	5.00	50.0	ug/L
106-46-7	1,4-Dichlorobenzene	5.00	UD	1.30	5.00	50.0	ug/L
95-50-1	1,2-Dichlorobenzene	5.00	UD	1.80	5.00	50.0	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	50.6		81 - 118		101%	SPK: 50
1868-53-7	Dibromofluoromethane	50.4		80 - 119		101%	SPK: 50
2037-26-5	Toluene-d8	52.5		89 - 112		105%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.4		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	99700	7.63				
540-36-3	1,4-Difluorobenzene	177000	8.55				
3114-55-4	Chlorobenzene-d5	175000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	79000	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/23/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-GW-618-620	SDG No.:	L2412
Lab Sample ID:	L2412-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061167.D	1		04/28/20 16:27	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	4.30	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	1.30	J	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/23/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-GW-618-620	SDG No.:	L2412
Lab Sample ID:	L2412-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061167.D	1		04/28/20 16:27	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	50.4		81 - 118		101%	SPK: 50
1868-53-7	Dibromofluoromethane	51.3		80 - 119		103%	SPK: 50
2037-26-5	Toluene-d8	51.3		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.6		85 - 114		103%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	102000	7.63				
540-36-3	1,4-Difluorobenzene	183000	8.55				
3114-55-4	Chlorobenzene-d5	176000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	80100	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/23/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-DUP-20200423	SDG No.:	L2412
Lab Sample ID:	L2412-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061168.D	1		04/28/20 16:50	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	3.20	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/23/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-DUP-20200423	SDG No.:	L2412
Lab Sample ID:	L2412-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061168.D	1		04/28/20 16:50	VN042820

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	51.4		81 - 118		103%	SPK: 50
1868-53-7	Dibromofluoromethane	51.9		80 - 119		104%	SPK: 50
2037-26-5	Toluene-d8	52.1		89 - 112		104%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.3		85 - 114		105%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	95100	7.63				
540-36-3	1,4-Difluorobenzene	170000	8.55				
3114-55-4	Chlorobenzene-d5	166000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	73800	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/23/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-GW-608-610	SDG No.:	L2412
Lab Sample ID:	L2412-06	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	92.4
Sample Wt/Vol:	5.01 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VW015345.D	1		04/24/20 16:02	VW042420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	32.8	U	19.2	32.8	65.7	ug/Kg
74-87-3	Chloromethane	52.5	U	29.3	52.5	65.7	ug/Kg
75-01-4	Vinyl Chloride	32.8	U	18.2	32.8	65.7	ug/Kg
74-83-9	Bromomethane	32.8	U	17.1	32.8	65.7	ug/Kg
75-00-3	Chloroethane	32.8	U	21.6	32.8	65.7	ug/Kg
75-69-4	Trichlorofluoromethane	32.8	U	19.6	32.8	65.7	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	32.8	U	21.6	32.8	65.7	ug/Kg
75-35-4	1,1-Dichloroethene	32.8	U	18.7	32.8	65.7	ug/Kg
67-64-1	Acetone	260	U	79.9	260	330	ug/Kg
75-15-0	Carbon Disulfide	32.8	U	12.8	32.8	65.7	ug/Kg
1634-04-4	Methyl tert-butyl Ether	52.5	U	18.6	52.5	65.7	ug/Kg
75-09-2	Methylene Chloride	110	U	75.0	110	130	ug/Kg
156-60-5	trans-1,2-Dichloroethene	52.5	U	20.9	52.5	65.7	ug/Kg
75-34-3	1,1-Dichloroethane	32.8	U	12.4	32.8	65.7	ug/Kg
78-93-3	2-Butanone	260	U	110	260	330	ug/Kg
56-23-5	Carbon Tetrachloride	32.8	U	11.7	32.8	65.7	ug/Kg
156-59-2	cis-1,2-Dichloroethene	32.8	U	18.3	32.8	65.7	ug/Kg
67-66-3	Chloroform	32.8	U	16.7	32.8	65.7	ug/Kg
71-55-6	1,1,1-Trichloroethane	32.8	U	10.0	32.8	65.7	ug/Kg
108-87-2	Methylcyclohexane	32.8	U	6.10	32.8	65.7	ug/Kg
71-43-2	Benzene	32.8	U	11.2	32.8	65.7	ug/Kg
107-06-2	1,2-Dichloroethane	32.8	U	12.0	32.8	65.7	ug/Kg
79-01-6	Trichloroethene	33.4	J	11.2	32.8	65.7	ug/Kg
78-87-5	1,2-Dichloropropane	32.8	U	11.6	32.8	65.7	ug/Kg
75-27-4	Bromodichloromethane	32.8	U	11.8	32.8	65.7	ug/Kg
108-10-1	4-Methyl-2-Pentanone	160	U	91.7	160	330	ug/Kg
108-88-3	Toluene	32.8	U	11.3	32.8	65.7	ug/Kg
10061-02-6	t-1,3-Dichloropropene	32.8	U	14.1	32.8	65.7	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	32.8	U	12.9	32.8	65.7	ug/Kg
79-00-5	1,1,2-Trichloroethane	52.5	U	13.0	52.5	65.7	ug/Kg
591-78-6	2-Hexanone	260	U	120	260	330	ug/Kg
124-48-1	Dibromochloromethane	32.8	U	14.0	32.8	65.7	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/23/20
Project:	CTO WE13	Date Received:	04/24/20
Client Sample ID:	BP-VPB180-GW-608-610	SDG No.:	L2412
Lab Sample ID:	L2412-06	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	92.4
Sample Wt/Vol:	5.01 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VW015345.D	1		04/24/20 16:02	VW042420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	32.8	U	11.5	32.8	65.7	ug/Kg
108-90-7	Chlorobenzene	32.8	U	11.8	32.8	65.7	ug/Kg
100-41-4	Ethyl Benzene	32.8	U	13.6	32.8	65.7	ug/Kg
179601-23-1	m/p-Xylenes	65.7	U	28.5	65.7	130	ug/Kg
95-47-6	o-Xylene	32.8	U	13.1	32.8	65.7	ug/Kg
100-42-5	Styrene	32.8	U	18.1	32.8	65.7	ug/Kg
75-25-2	Bromoform	52.5	U	15.8	52.5	65.7	ug/Kg
98-82-8	Isopropylbenzene	32.8	U	14.9	32.8	65.7	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	32.8	U	14.0	32.8	65.7	ug/Kg
541-73-1	1,3-Dichlorobenzene	32.8	U	17.0	32.8	65.7	ug/Kg
106-46-7	1,4-Dichlorobenzene	32.8	U	11.2	32.8	65.7	ug/Kg
95-50-1	1,2-Dichlorobenzene	52.5	U	13.6	52.5	65.7	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53.2		71 - 136		106%	SPK: 50
1868-53-7	Dibromofluoromethane	54.3		78 - 119		109%	SPK: 50
2037-26-5	Toluene-d8	52.0		85 - 116		104%	SPK: 50
460-00-4	4-Bromofluorobenzene	48.5		79 - 119		97%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	208000	7.95				
540-36-3	1,4-Difluorobenzene	283000	8.84				
3114-55-4	Chlorobenzene-d5	262000	11.63				
3855-82-1	1,4-Dichlorobenzene-d4	122000	13.56				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Appendix C

Support Documents

A. Documents Supporting Qualifications

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Matrix Spike/Matrix Spike Duplicate Summary
SW-846

SDG No.: L2412

Client: Tetra Tech NUS, Inc.

Analytical Method: SW8260-Low

Parameter	Spike	Sample Result	Result	Units	Rec			RPD		Limits		RPD
					Rec	Qual	RPD	Qual	Low	High		
Lab Sample ID :	L2414-07MS	Client Sample ID :	ST006RW149-200422MS			Datafile :		VN061176.D				
Chloromethane	50	0	50.8	ug/L	102				50	139		
Vinyl chloride	50	0	130	ug/L	260	*			58	137		
Bromomethane	50	0	49.2	ug/L	98				53	141		
Chloroethane	50	0	50.0	ug/L	100				60	138		
Trichlorofluoromethane	50	0	54.9	ug/L	110				65	141		
1,1,2-Trichlorotrifluoroethane	50	0	52.1	ug/L	104				70	136		
1,1-Dichloroethene	50	0	52.8	ug/L	106				71	131		
Acetone	250	0	240	ug/L	96				39	160		
Carbon disulfide	50	0	52.1	ug/L	104				64	133		
Methyl tert-butyl Ether	50	0	50.4	ug/L	101				71	124		
Methylene Chloride	50	0	51.0	ug/L	102				74	124		
trans-1,2-Dichloroethene	50	0	55.8	ug/L	112				75	124		
1,1-Dichloroethane	50	0	52.8	ug/L	106				77	125		
2-Butanone	250	0	250	ug/L	100				56	143		
Carbon Tetrachloride	50	0	58.0	ug/L	116				72	136		
cis-1,2-Dichloroethene	50	0	1000	ug/L	2000	*			78	123		
Chloroform	50	0	51.3	ug/L	103				79	124		
1,1,1-Trichloroethane	50	0	56.9	ug/L	114				74	131		
Methylcyclohexane	50	0	61.1	ug/L	122				72	132		
Benzene	50	0	51.3	ug/L	103				79	120		
1,2-Dichloroethane	50	0	52.3	ug/L	105				73	128		
Trichloroethene	50	0	58.2	ug/L	116				79	123		
1,2-Dichloropropane	50	0	51.1	ug/L	102				78	122		
Bromodichloromethane	50	0	54.0	ug/L	108				79	125		
4-Methyl-2-Pentanone	250	0	250	ug/L	100				67	130		
Toluene	50	0	53.4	ug/L	107				80	121		
t-1,3-Dichloropropene	50	0	52.3	ug/L	105				73	127		
cis-1,3-Dichloropropene	50	0	51.3	ug/L	103				75	124		
1,1,2-Trichloroethane	50	0	54.6	ug/L	109				80	119		
2-Hexanone	250	0	250	ug/L	100				57	139		
Dibromochloromethane	50	0	53.1	ug/L	106				74	126		
Tetrachloroethene	50	0	54.8	ug/L	110				74	129		
Chlorobenzene	50	0	52.3	ug/L	105				82	118		
Ethyl Benzene	50	0	53.3	ug/L	107				79	121		
m/p-Xylenes	100	0	110	ug/L	110				80	121		
o-Xylene	50	0	52.8	ug/L	106				78	122		
Styrene	50	0	54.0	ug/L	108				78	123		
Bromoform	50	0	54.4	ug/L	109				66	130		
Isopropylbenzene	50	0	51.1	ug/L	102				72	131		
1,1,2,2-Tetrachloroethane	50	0	50.5	ug/L	101				71	121		
1,3-Dichlorobenzene	50	0	51.2	ug/L	102				80	119		
1,4-Dichlorobenzene	50	0	50.2	ug/L	100				79	118		
1,2-Dichlorobenzene	50	0	51.0	ug/L	102				80	119		

**Matrix Spike/Matrix Spike Duplicate Summary
SW-846**

SDG No.: L2412

Client: Tetra Tech NUS, Inc.

Analytical Method: SW8260-Low


Parameter	Spike	Sample Result	Result	Units	Rec			RPD		Limits		RPD
					Rec	Qual	RPD	Qual	Low	High		
Lab Sample ID :	L2414-08MSD	Client Sample ID :	ST006RW149-200422MSD			Datafile :		VN061177.D				
Chloromethane	50	0	55.2	ug/L	110		8		50	139	20	
Vinyl chloride	50	0	140	ug/L	280	*	7		58	137	20	
Bromomethane	50	0	53.6	ug/L	107		9		53	141	20	
Chloroethane	50	0	52.8	ug/L	106		5		60	138	20	
Trichlorofluoromethane	50	0	56.8	ug/L	114		3		65	141	20	
1,1,2-Trichlorotrifluoroethane	50	0	53.1	ug/L	106		2		70	136	20	
1,1-Dichloroethene	50	0	56.0	ug/L	112		6		71	131	20	
Acetone	250	0	250	ug/L	100		4		39	160	20	
Carbon disulfide	50	0	55.6	ug/L	111		6		64	133	20	
Methyl tert-butyl Ether	50	0	53.7	ug/L	107		6		71	124	20	
Methylene Chloride	50	0	53.7	ug/L	107		5		74	124	20	
trans-1,2-Dichloroethene	50	0	58.6	ug/L	117		5		75	124	20	
1,1-Dichloroethane	50	0	55.6	ug/L	111		5		77	125	20	
2-Butanone	250	0	270	ug/L	108		8		56	143	20	
Carbon Tetrachloride	50	0	61.5	ug/L	123		6		72	136	20	
cis-1,2-Dichloroethene	50	0	1200	ug/L	2400	*	18		78	123	20	
Chloroform	50	0	53.9	ug/L	108		5		79	124	20	
1,1,1-Trichloroethane	50	0	59.7	ug/L	119		5		74	131	20	
Methylcyclohexane	50	0	63.2	ug/L	126		3		72	132	20	
Benzene	50	0	53.7	ug/L	107		5		79	120	20	
1,2-Dichloroethane	50	0	54.5	ug/L	109		4		73	128	20	
Trichloroethene	50	0	62.9	ug/L	126	*	8		79	123	20	
1,2-Dichloropropane	50	0	54.5	ug/L	109		6		78	122	20	
Bromodichloromethane	50	0	56.6	ug/L	113		5		79	125	20	
4-Methyl-2-Pentanone	250	0	260	ug/L	104		4		67	130	20	
Toluene	50	0	55.4	ug/L	111		4		80	121	20	
t-1,3-Dichloropropene	50	0	54.8	ug/L	110		5		73	127	20	
cis-1,3-Dichloropropene	50	0	53.6	ug/L	107		4		75	124	20	
1,1,2-Trichloroethane	50	0	67.3	ug/L	135	*	21	*	80	119	20	
2-Hexanone	250	0	260	ug/L	104		4		57	139	20	
Dibromochloromethane	50	0	56.6	ug/L	113		6		74	126	20	
Tetrachloroethene	50	0	56.7	ug/L	113		3		74	129	20	
Chlorobenzene	50	0	54.3	ug/L	109		4		82	118	20	
Ethyl Benzene	50	0	55.5	ug/L	111		4		79	121	20	
m/p-Xylenes	100	0	110	ug/L	110		0		80	121	20	
o-Xylene	50	0	55.4	ug/L	111		5		78	122	20	
Styrene	50	0	56.4	ug/L	113		4		78	123	20	
Bromoform	50	0	57.0	ug/L	114		5		66	130	20	
Isopropylbenzene	50	0	55.1	ug/L	110		8		72	131	20	
1,1,2,2-Tetrachloroethane	50	0	52.9	ug/L	106		5		71	121	20	
1,3-Dichlorobenzene	50	0	54.1	ug/L	108		6		80	119	20	
1,4-Dichlorobenzene	50	0	53.6	ug/L	107		7		79	118	20	
1,2-Dichlorobenzene	50	0	54.4	ug/L	109		6		80	119	20	

Appendix C

Support Documents

B. Chain of Custody (COC)

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 CHAIN OF CUSTODY RECORD	284 Sheffield Street, Mountainside, NJ 07092 (908) 789-8900 Fax: (908) 78-8922 www.chemtech.net	Chemtech Project Number: <u>L2412</u> COC Number:
--	--	--

CLIENT INFORMATION	PROJECT INFORMATION	BILLING INFORMATION
COMPANY: Tetra Tech	PROJECT NAME: NWIRP Bethpage	BILL TO: SEE CONTRACT PO#
ADDRESS: 5700 Lake Wright Dr., Suite 102	PROJECT #: 112G08005-WE13 LOCATION: VPB-180	ADDRESS:
CITY: Norfolk STATE: VA ZIP: 23502	PROJECT MANAGER: Dave Brayack	CITY: STATE: ZIP:
ATTENTION: Dave Brayack	E-MAIL: david.brayack@tetratech.com	ATTENTION: PHONE:
PHONE: 757-466-4909 FAX: 757-461-4148	PHONE: 757-466-4909 FAX: 757-461-4148	

DATA TURNAROUND INFORMATION	DATA DELIVERABLE INFORMATION	ANALYSIS																				
FAX: _____ 2 _____ DAYS* HARD COPY: _____ 2 _____ DAYS* EDD _____ 2 _____ DAYS* * TO BE APPROVED BY CHEMTECH STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS	<input type="checkbox"/> RESULTS ONLY <input type="checkbox"/> USEPA CLP <input type="checkbox"/> RESULTS + QC <input type="checkbox"/> New York State ASP "B" <input type="checkbox"/> New Jersey REDUCED <input type="checkbox"/> New York State ASP "A" <input type="checkbox"/> New Jersey CLP <input type="checkbox"/> Other _____ <input type="checkbox"/> EDD Format _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">VOC(SW846-8260B)</th> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>	VOC(SW846-8260B)	1	2	3	4	5	6	7	8	9										
VOC(SW846-8260B)	1	2	3	4	5	6	7	8	9													

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# of Bottles	PRESERVATIVES									COMMENTS		
			COMP	GRAB	DATE	TIME		A											
1.	BP-VPB180-TB-20200422	AQ		X	4/22/20	9:00	2	2											
2.	BP-VPB180-GW-588-590	AQ		X	4/22/20	11:48	4	4											Very turbid
3.	BP-VPB180-GW-608-610	AQ		X	4/23/20	11:36	5	5											Very turbid
4.	BP-VPB180-GW-618-620	AQ		X	4/23/20	13:36	2	2											
5.	BP-VPB180-DUP-20200423	AQ		X	4/23/20	11:00	2	2											
6.																			
7.																			
8.																			
9.																			
10.																			

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER	DATE/TIME <u>4-24-20</u>	RECEIVED BY <u>[Signature]</u>	Conditions of bottles or coolers at receipt: <input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Cooler Temp <u>3.2°C</u> MeOH extraction requires an additional 4oz. Jar for percent solid <input type="checkbox"/> Ice in Cooler? <u>yes</u>
RELINQUISHED BY	DATE/TIME	RECEIVED BY	Comments: 48hr TAT - For VOC's see worksheet #15 of SAP 2018 for VPB program VOC list
RELINQUISHED BY	DATE/TIME	RECEIVED FOR LAB BY	
RELINQUISHED BY	DATE/TIME	RECEIVED FOR LAB BY	

Page 1 of 1 SHIPPED VIA: CLIENT: Hand Delivered Overnight
 CHEMTECH: Picked Up Overnight **Shipment Complete**
 YES NO

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

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Appendix C

Support Documents

C. Calculations for Stage 4 Data Validation

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SDG L2412

Verification calculations follow the written formula with the verification results compared to the reported value, verification value vs. reported value.

VOC (8260) SAMPLE QUANTITATION

trichloroethene for BP-VPB180-GW-588-590

$$\text{Cpd. Concentration} = \frac{(\text{Area}_c)(\text{Conc}_{istd})(V_f)(DL)}{(\text{Area}_{st})(RRF_c)(V_i)}$$

Calc. Concentration = 397.1

AREA c	AREA st	CONC istd	RRF	Vf	Vi	DL
56487	176506	50	0.403	5000	5000	10

Reported Concentration = 400

VALIDATA

Chemical Services, Inc.

2159 Wynnton Pointe, Duluth, GA 30097

(770) 232-0130

(770) 232-5082 (Fax)

www.datavalidator.com

DATA VALIDATION SUMMARY REPORT - CHEMISTRY

COMPANY: Tetra Tech, Inc., Norfolk, VA
PROJECT NAME: Basewide Groundwater Investigation, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, N62470-16-D-9008
SITE NAME: CTO-WE13
CONTRACTED LAB: CHEMTECH, Mountainside, NJ
JOB NO./ACCOUNTING CODE: 112G08005-WE13
QA/QC LEVEL: EPA Stage 4
ANALYTICAL METHOD(S): SW846 Methods 8260C
VALIDATION GUIDELINES: Tier II Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Installation Program Site 0001 – Former Drum Marshalling Area Operable Unit 2 Plume Naval Weapons Industrial Reserve Plant Bethpage, New York, March 2019, DOD QSM 5.0; July 2013, DOD Data Validation Guidance, February 2018, Method criteria, Laboratory limits and Professional Judgment
SAMPLE MATRICES: Soil and Groundwater
TYPES OF ANALYSES: Volatile Organic Compounds (VOC)
DATA VALIDATION DATE: June 16, 2020
DATA REVIEWER(S): Amy L. Hogan
SDG NUMBER: L2443
SAMPLING DATE(S): April 24-28, 2020

SAMPLES:

<u>Client Sample ID</u>	<u>Laboratory ID</u>	<u>VOC</u>
BP-VPB180-GW-658-660	L2443-01	X
BP-VPB180-GW-678-680	L2443-02	X
BP-VPB180-GW-708-710	L2443-03	X
BP-VPB180-GW-718-720	L2443-04	X
BP-VPB180-TB-20200424	L2443-05	X
BP-VPB180-GW-638-640	L2443-06	X
BP-VPB180-EB-20200424	L2443-07	X
BP-VPB180-GW-738-740	L2443-08	X

Suffix Codes: DL= DILUTION, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA VALIDATION SUMMARY

CHEMTECH – SDG: L2443 – Organic Chemistry

VOLATILE ORGANICS

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW846 Method 8260C.

II.) Overall Assessment of Data:

All laboratory data were acceptable without qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No data qualification was necessary.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks for this SDG. No data qualification was necessary.

Equipment and Rinse Blanks:

There were no detections in associated equipment blank BP-VPB-EB-20200424. No data qualification was necessary.

Field Blank:

There were no associated field blanks for this SDG. No data qualification was necessary.

Trip Blank:

There were no detections in associated trip blank BP-VPB180-TB-20200424. No data qualification was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

Two LCS / LCSD sets were analyzed by the laboratory for this SDG. All criteria were met. No data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses data were not submitted for this SDG. Data qualification based on the absence of MS / MSD data was not required. No data qualification was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples identified as part of this SDG. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All forty-three requested compounds for groundwater samples and all forty-four requested compounds for soil samples were reported with acceptable LOD and LOQ results as determined by the SAP.

The validator has noted that the non-detect results for the following compounds were reported at the LOD, which exceeds the PAL limit of 0.17 ug/L for the groundwater samples : carbon disulfide, carbon tetrachloride, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene , 1,1,2,2-tetrachloroethane, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene and 1,1,2-trichlorotrifluoroethane.

The validator has noted that the non-detect results for vinyl chloride in all groundwater samples were reported at the LOD, which exceeds the PAL limit of 0.67 ug/L.

XII.) Sample Calculation Verification (Stage 4):

No discrepancies were noted in the sample calculation verification process.

Appendix A

Data Qualification Summary Table (DQST) with Qualification Codes

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DATA QUALIFICATION SUMMARY TABLE (DQST) WITH QUALIFICATION CODES

Client Sample ID	Lab Sample ID	Date Collected	Analyte	Lab Qual	Val Result	Val Qual	Val Reason
N/A	N/A	N/A	N/A	No qualifications were made			

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Appendix B

Laboratory Sample Results

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Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/24/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-TB-20200424	SDG No.:	L2443
Lab Sample ID:	L2443-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061185.D	1		04/29/20 12:18	VN042920

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/24/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-TB-20200424	SDG No.:	L2443
Lab Sample ID:	L2443-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061185.D	1		04/29/20 12:18	VN042920

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	50.6		81 - 118		101%	SPK: 50
1868-53-7	Dibromofluoromethane	50.9		80 - 119		102%	SPK: 50
2037-26-5	Toluene-d8	51.5		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	50.6		85 - 114		101%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	96800	7.62				
540-36-3	1,4-Difluorobenzene	171000	8.55				
3114-55-4	Chlorobenzene-d5	162000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	70700	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/24/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-638-640	SDG No.:	L2443
Lab Sample ID:	L2443-06	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061192.D	1		04/29/20 15:00	VN042920

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	13.0	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/24/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-638-640	SDG No.:	L2443
Lab Sample ID:	L2443-06	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061192.D	1		04/29/20 15:00	VN042920

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	52.3		81 - 118		105%	SPK: 50
1868-53-7	Dibromofluoromethane	52.2		80 - 119		104%	SPK: 50
2037-26-5	Toluene-d8	51.3		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.4		85 - 114		103%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	92400	7.63				
540-36-3	1,4-Difluorobenzene	166000	8.55				
3114-55-4	Chlorobenzene-d5	162000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	73400	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/24/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-EB-20200424	SDG No.:	L2443
Lab Sample ID:	L2443-07	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061186.D	1		04/29/20 12:41	VN042920

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/24/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-EB-20200424	SDG No.:	L2443
Lab Sample ID:	L2443-07	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061186.D	1		04/29/20 12:41	VN042920

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	52.1		81 - 118		104%	SPK: 50
1868-53-7	Dibromofluoromethane	49.6		80 - 119		99%	SPK: 50
2037-26-5	Toluene-d8	52.0		89 - 112		104%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.6		85 - 114		103%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	92800	7.63				
540-36-3	1,4-Difluorobenzene	166000	8.55				
3114-55-4	Chlorobenzene-d5	160000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	70600	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/28/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-738-740	SDG No.:	L2443
Lab Sample ID:	L2443-08	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061193.D	1		04/29/20 15:24	VN042920

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	11.4	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	14.8		0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/28/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-738-740	SDG No.:	L2443
Lab Sample ID:	L2443-08	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061193.D	1		04/29/20 15:24	VN042920

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	52.5		81 - 118		105%	SPK: 50
1868-53-7	Dibromofluoromethane	52.9		80 - 119		106%	SPK: 50
2037-26-5	Toluene-d8	52.4		89 - 112		105%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.4		85 - 114		103%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	87100	7.63				
540-36-3	1,4-Difluorobenzene	156000	8.55				
3114-55-4	Chlorobenzene-d5	152000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	66800	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/24/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-658-660	SDG No.:	L2443
Lab Sample ID:	L2443-01	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	84.8
Sample Wt/Vol:	4.99 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002541.D	1		05/04/20 15:18	VY050420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	16.5	U	9.70	16.5	33.0	ug/Kg
74-87-3	Chloromethane	26.4	U	14.7	26.4	33.0	ug/Kg
75-01-4	Vinyl Chloride	16.5	U	9.10	16.5	33.0	ug/Kg
74-83-9	Bromomethane	16.5	U	8.60	16.5	33.0	ug/Kg
75-00-3	Chloroethane	16.5	U	10.8	16.5	33.0	ug/Kg
75-69-4	Trichlorofluoromethane	16.5	U	9.90	16.5	33.0	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	16.5	U	10.8	16.5	33.0	ug/Kg
75-35-4	1,1-Dichloroethene	16.5	U	9.40	16.5	33.0	ug/Kg
67-64-1	Acetone	110	J	40.1	130	160	ug/Kg
75-15-0	Carbon Disulfide	8.30	J	6.40	16.5	33.0	ug/Kg
1634-04-4	Methyl tert-butyl Ether	26.4	U	9.30	26.4	33.0	ug/Kg
75-09-2	Methylene Chloride	52.7	U	37.6	52.7	65.9	ug/Kg
156-60-5	trans-1,2-Dichloroethene	26.4	U	10.5	26.4	33.0	ug/Kg
75-34-3	1,1-Dichloroethane	16.5	U	6.20	16.5	33.0	ug/Kg
78-93-3	2-Butanone	130	U	54.7	130	160	ug/Kg
56-23-5	Carbon Tetrachloride	16.5	U	5.90	16.5	33.0	ug/Kg
156-59-2	cis-1,2-Dichloroethene	16.5	U	9.20	16.5	33.0	ug/Kg
67-66-3	Chloroform	16.5	U	8.40	16.5	33.0	ug/Kg
71-55-6	1,1,1-Trichloroethane	16.5	U	5.00	16.5	33.0	ug/Kg
108-87-2	Methylcyclohexane	16.5	U	3.00	16.5	33.0	ug/Kg
71-43-2	Benzene	16.5	U	5.60	16.5	33.0	ug/Kg
107-06-2	1,2-Dichloroethane	16.5	U	6.00	16.5	33.0	ug/Kg
79-01-6	Trichloroethene	16.5	U	5.60	16.5	33.0	ug/Kg
78-87-5	1,2-Dichloropropane	16.5	U	5.80	16.5	33.0	ug/Kg
75-27-4	Bromodichloromethane	16.5	U	5.90	16.5	33.0	ug/Kg
108-10-1	4-Methyl-2-Pentanone	82.4	U	46.0	82.4	160	ug/Kg
108-88-3	Toluene	16.5	U	5.70	16.5	33.0	ug/Kg
10061-02-6	t-1,3-Dichloropropene	16.5	U	7.10	16.5	33.0	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	16.5	U	6.50	16.5	33.0	ug/Kg
79-00-5	1,1,2-Trichloroethane	26.4	U	6.50	26.4	33.0	ug/Kg
591-78-6	2-Hexanone	130	U	58.2	130	160	ug/Kg
124-48-1	Dibromochloromethane	16.5	U	7.00	16.5	33.0	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/24/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-658-660	SDG No.:	L2443
Lab Sample ID:	L2443-01	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	84.8
Sample Wt/Vol:	4.99 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002541.D	1		05/04/20 15:18	VY050420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	16.5	U	5.80	16.5	33.0	ug/Kg
108-90-7	Chlorobenzene	16.5	U	5.90	16.5	33.0	ug/Kg
100-41-4	Ethyl Benzene	16.5	U	6.80	16.5	33.0	ug/Kg
179601-23-1	m/p-Xylenes	33.0	U	14.3	33.0	65.9	ug/Kg
95-47-6	o-Xylene	16.5	U	6.60	16.5	33.0	ug/Kg
100-42-5	Styrene	16.5	U	9.10	16.5	33.0	ug/Kg
75-25-2	Bromoform	26.4	U	7.90	26.4	33.0	ug/Kg
98-82-8	Isopropylbenzene	16.5	U	7.50	16.5	33.0	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	16.5	U	7.00	16.5	33.0	ug/Kg
541-73-1	1,3-Dichlorobenzene	16.5	U	8.50	16.5	33.0	ug/Kg
106-46-7	1,4-Dichlorobenzene	16.5	U	5.60	16.5	33.0	ug/Kg
95-50-1	1,2-Dichlorobenzene	26.4	U	6.80	26.4	33.0	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	63.3		71 - 136		127%	SPK: 50
1868-53-7	Dibromofluoromethane	54.1		78 - 119		108%	SPK: 50
2037-26-5	Toluene-d8	52.4		85 - 116		105%	SPK: 50
460-00-4	4-Bromofluorobenzene	50.8		79 - 119		102%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	289000	7.8				
540-36-3	1,4-Difluorobenzene	469000	8.69				
3114-55-4	Chlorobenzene-d5	425000	11.49				
3855-82-1	1,4-Dichlorobenzene-d4	205000	13.42				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/24/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-678-680	SDG No.:	L2443
Lab Sample ID:	L2443-02	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	85.1
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002542.D	1		05/04/20 15:40	VY050420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	16.8	U	9.80	16.8	33.6	ug/Kg
74-87-3	Chloromethane	26.8	U	15.0	26.8	33.6	ug/Kg
75-01-4	Vinyl Chloride	16.8	U	9.30	16.8	33.6	ug/Kg
74-83-9	Bromomethane	16.8	U	8.70	16.8	33.6	ug/Kg
75-00-3	Chloroethane	16.8	U	11.0	16.8	33.6	ug/Kg
75-69-4	Trichlorofluoromethane	16.8	U	10.0	16.8	33.6	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	16.8	U	11.0	16.8	33.6	ug/Kg
75-35-4	1,1-Dichloroethene	16.8	U	9.50	16.8	33.6	ug/Kg
67-64-1	Acetone	130	J	40.8	130	170	ug/Kg
75-15-0	Carbon Disulfide	16.8	U	6.50	16.8	33.6	ug/Kg
1634-04-4	Methyl tert-butyl Ether	26.8	U	9.50	26.8	33.6	ug/Kg
75-09-2	Methylene Chloride	53.7	U	38.3	53.7	67.1	ug/Kg
156-60-5	trans-1,2-Dichloroethene	26.8	U	10.7	26.8	33.6	ug/Kg
75-34-3	1,1-Dichloroethane	16.8	U	6.30	16.8	33.6	ug/Kg
78-93-3	2-Butanone	130	U	55.7	130	170	ug/Kg
56-23-5	Carbon Tetrachloride	16.8	U	6.00	16.8	33.6	ug/Kg
156-59-2	cis-1,2-Dichloroethene	16.8	U	9.40	16.8	33.6	ug/Kg
67-66-3	Chloroform	16.8	U	8.60	16.8	33.6	ug/Kg
71-55-6	1,1,1-Trichloroethane	16.8	U	5.10	16.8	33.6	ug/Kg
108-87-2	Methylcyclohexane	16.8	U	3.10	16.8	33.6	ug/Kg
71-43-2	Benzene	16.8	U	5.70	16.8	33.6	ug/Kg
107-06-2	1,2-Dichloroethane	16.8	U	6.10	16.8	33.6	ug/Kg
79-01-6	Trichloroethene	16.8	U	5.70	16.8	33.6	ug/Kg
78-87-5	1,2-Dichloropropane	16.8	U	5.90	16.8	33.6	ug/Kg
75-27-4	Bromodichloromethane	16.8	U	6.00	16.8	33.6	ug/Kg
108-10-1	4-Methyl-2-Pentanone	83.9	U	46.8	83.9	170	ug/Kg
108-88-3	Toluene	16.8	U	5.80	16.8	33.6	ug/Kg
10061-02-6	t-1,3-Dichloropropene	16.8	U	7.20	16.8	33.6	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	16.8	U	6.60	16.8	33.6	ug/Kg
79-00-5	1,1,2-Trichloroethane	26.8	U	6.70	26.8	33.6	ug/Kg
591-78-6	2-Hexanone	130	U	59.2	130	170	ug/Kg
124-48-1	Dibromochloromethane	16.8	U	7.10	16.8	33.6	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/24/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-678-680	SDG No.:	L2443
Lab Sample ID:	L2443-02	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	85.1
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002542.D	1		05/04/20 15:40	VY050420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	16.8	U	5.90	16.8	33.6	ug/Kg
108-90-7	Chlorobenzene	16.8	U	6.00	16.8	33.6	ug/Kg
100-41-4	Ethyl Benzene	16.8	U	6.90	16.8	33.6	ug/Kg
179601-23-1	m/p-Xylenes	33.6	U	14.6	33.6	67.1	ug/Kg
95-47-6	o-Xylene	16.8	U	6.70	16.8	33.6	ug/Kg
100-42-5	Styrene	16.8	U	9.30	16.8	33.6	ug/Kg
75-25-2	Bromoform	26.8	U	8.10	26.8	33.6	ug/Kg
98-82-8	Isopropylbenzene	16.8	U	7.60	16.8	33.6	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	16.8	U	7.20	16.8	33.6	ug/Kg
541-73-1	1,3-Dichlorobenzene	16.8	U	8.70	16.8	33.6	ug/Kg
106-46-7	1,4-Dichlorobenzene	16.8	U	5.70	16.8	33.6	ug/Kg
95-50-1	1,2-Dichlorobenzene	26.8	U	7.00	26.8	33.6	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	64.5		71 - 136		129%	SPK: 50
1868-53-7	Dibromofluoromethane	55.0		78 - 119		110%	SPK: 50
2037-26-5	Toluene-d8	52.6		85 - 116		105%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.7		79 - 119		103%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	277000	7.8				
540-36-3	1,4-Difluorobenzene	455000	8.69				
3114-55-4	Chlorobenzene-d5	419000	11.49				
3855-82-1	1,4-Dichlorobenzene-d4	203000	13.42				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/27/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-708-710	SDG No.:	L2443
Lab Sample ID:	L2443-03	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	88.6
Sample Wt/Vol:	5.03 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002543.D	1		05/04/20 16:03	VY050420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	21.8	U	12.8	21.8	43.6	ug/Kg
74-87-3	Chloromethane	34.9	U	19.4	34.9	43.6	ug/Kg
75-01-4	Vinyl Chloride	21.8	U	12.1	21.8	43.6	ug/Kg
74-83-9	Bromomethane	21.8	U	11.4	21.8	43.6	ug/Kg
75-00-3	Chloroethane	21.8	U	14.3	21.8	43.6	ug/Kg
75-69-4	Trichlorofluoromethane	21.8	U	13.0	21.8	43.6	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	21.8	U	14.3	21.8	43.6	ug/Kg
75-35-4	1,1-Dichloroethene	21.8	U	12.4	21.8	43.6	ug/Kg
67-64-1	Acetone	110	J	53.1	170	220	ug/Kg
75-15-0	Carbon Disulfide	21.8	U	8.50	21.8	43.6	ug/Kg
1634-04-4	Methyl tert-butyl Ether	34.9	U	12.4	34.9	43.6	ug/Kg
75-09-2	Methylene Chloride	69.8	U	49.8	69.8	87.2	ug/Kg
156-60-5	trans-1,2-Dichloroethene	34.9	U	13.9	34.9	43.6	ug/Kg
75-34-3	1,1-Dichloroethane	21.8	U	8.20	21.8	43.6	ug/Kg
78-93-3	2-Butanone	170	U	72.4	170	220	ug/Kg
56-23-5	Carbon Tetrachloride	21.8	U	7.80	21.8	43.6	ug/Kg
156-59-2	cis-1,2-Dichloroethene	21.8	U	12.2	21.8	43.6	ug/Kg
67-66-3	Chloroform	21.8	U	11.1	21.8	43.6	ug/Kg
71-55-6	1,1,1-Trichloroethane	21.8	U	6.60	21.8	43.6	ug/Kg
108-87-2	Methylcyclohexane	21.8	U	4.00	21.8	43.6	ug/Kg
71-43-2	Benzene	21.8	U	7.40	21.8	43.6	ug/Kg
107-06-2	1,2-Dichloroethane	21.8	U	7.90	21.8	43.6	ug/Kg
79-01-6	Trichloroethene	37.2	J	7.40	21.8	43.6	ug/Kg
78-87-5	1,2-Dichloropropane	21.8	U	7.70	21.8	43.6	ug/Kg
75-27-4	Bromodichloromethane	21.8	U	7.90	21.8	43.6	ug/Kg
108-10-1	4-Methyl-2-Pentanone	110	U	60.9	110	220	ug/Kg
108-88-3	Toluene	21.8	U	7.50	21.8	43.6	ug/Kg
10061-02-6	t-1,3-Dichloropropene	21.8	U	9.40	21.8	43.6	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	21.8	U	8.50	21.8	43.6	ug/Kg
79-00-5	1,1,2-Trichloroethane	34.9	U	8.70	34.9	43.6	ug/Kg
591-78-6	2-Hexanone	170	U	76.9	170	220	ug/Kg
124-48-1	Dibromochloromethane	21.8	U	9.30	21.8	43.6	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/27/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-708-710	SDG No.:	L2443
Lab Sample ID:	L2443-03	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	88.6
Sample Wt/Vol:	5.03 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002543.D	1		05/04/20 16:03	VY050420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	21.8	U	7.60	21.8	43.6	ug/Kg
108-90-7	Chlorobenzene	21.8	U	7.80	21.8	43.6	ug/Kg
100-41-4	Ethyl Benzene	21.8	U	9.00	21.8	43.6	ug/Kg
179601-23-1	m/p-Xylenes	43.6	U	18.9	43.6	87.2	ug/Kg
95-47-6	o-Xylene	21.8	U	8.70	21.8	43.6	ug/Kg
100-42-5	Styrene	21.8	U	12.0	21.8	43.6	ug/Kg
75-25-2	Bromoform	34.9	U	10.5	34.9	43.6	ug/Kg
98-82-8	Isopropylbenzene	21.8	U	9.90	21.8	43.6	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	21.8	U	9.30	21.8	43.6	ug/Kg
541-73-1	1,3-Dichlorobenzene	21.8	U	11.3	21.8	43.6	ug/Kg
106-46-7	1,4-Dichlorobenzene	21.8	U	7.40	21.8	43.6	ug/Kg
95-50-1	1,2-Dichlorobenzene	34.9	U	9.10	34.9	43.6	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	62.8		71 - 136		126%	SPK: 50
1868-53-7	Dibromofluoromethane	54.9		78 - 119		110%	SPK: 50
2037-26-5	Toluene-d8	52.5		85 - 116		105%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.2		79 - 119		104%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	293000	7.8				
540-36-3	1,4-Difluorobenzene	479000	8.7				
3114-55-4	Chlorobenzene-d5	436000	11.49				
3855-82-1	1,4-Dichlorobenzene-d4	214000	13.42				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/28/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-718-720	SDG No.:	L2443
Lab Sample ID:	L2443-04	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	87.7
Sample Wt/Vol:	5.08 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002544.D	1		05/04/20 16:25	VY050420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	20.0	U	11.7	20.0	40.0	ug/Kg
74-87-3	Chloromethane	32.0	U	17.8	32.0	40.0	ug/Kg
75-01-4	Vinyl Chloride	20.0	U	11.1	20.0	40.0	ug/Kg
74-83-9	Bromomethane	20.0	U	10.4	20.0	40.0	ug/Kg
75-00-3	Chloroethane	20.0	U	13.1	20.0	40.0	ug/Kg
75-69-4	Trichlorofluoromethane	20.0	U	12.0	20.0	40.0	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	20.0	U	13.1	20.0	40.0	ug/Kg
75-35-4	1,1-Dichloroethene	20.0	U	11.4	20.0	40.0	ug/Kg
67-64-1	Acetone	100	J	48.7	160	200	ug/Kg
75-15-0	Carbon Disulfide	9.40	J	7.80	20.0	40.0	ug/Kg
1634-04-4	Methyl tert-butyl Ether	32.0	U	11.3	32.0	40.0	ug/Kg
75-09-2	Methylene Chloride	64.0	U	45.7	64.0	80.0	ug/Kg
156-60-5	trans-1,2-Dichloroethene	32.0	U	12.7	32.0	40.0	ug/Kg
75-34-3	1,1-Dichloroethane	20.0	U	7.50	20.0	40.0	ug/Kg
78-93-3	2-Butanone	160	U	66.4	160	200	ug/Kg
56-23-5	Carbon Tetrachloride	20.0	U	7.10	20.0	40.0	ug/Kg
156-59-2	cis-1,2-Dichloroethene	20.0	U	11.2	20.0	40.0	ug/Kg
67-66-3	Chloroform	20.0	U	10.2	20.0	40.0	ug/Kg
71-55-6	1,1,1-Trichloroethane	20.0	U	6.10	20.0	40.0	ug/Kg
108-87-2	Methylcyclohexane	20.0	U	3.70	20.0	40.0	ug/Kg
71-43-2	Benzene	20.0	U	6.80	20.0	40.0	ug/Kg
107-06-2	1,2-Dichloroethane	20.0	U	7.30	20.0	40.0	ug/Kg
79-01-6	Trichloroethene	21.3	J	6.80	20.0	40.0	ug/Kg
78-87-5	1,2-Dichloropropane	20.0	U	7.10	20.0	40.0	ug/Kg
75-27-4	Bromodichloromethane	20.0	U	7.20	20.0	40.0	ug/Kg
108-10-1	4-Methyl-2-Pentanone	100	U	55.9	100	200	ug/Kg
108-88-3	Toluene	20.0	U	6.90	20.0	40.0	ug/Kg
10061-02-6	t-1,3-Dichloropropene	20.0	U	8.60	20.0	40.0	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	20.0	U	7.80	20.0	40.0	ug/Kg
79-00-5	1,1,2-Trichloroethane	32.0	U	7.90	32.0	40.0	ug/Kg
591-78-6	2-Hexanone	160	U	70.6	160	200	ug/Kg
124-48-1	Dibromochloromethane	20.0	U	8.50	20.0	40.0	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/28/20
Project:	CTO WE13	Date Received:	04/29/20
Client Sample ID:	BP-VPB180-GW-718-720	SDG No.:	L2443
Lab Sample ID:	L2443-04	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	87.7
Sample Wt/Vol:	5.08 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002544.D	1		05/04/20 16:25	VY050420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	20.0	U	7.00	20.0	40.0	ug/Kg
108-90-7	Chlorobenzene	20.0	U	7.20	20.0	40.0	ug/Kg
100-41-4	Ethyl Benzene	20.0	U	8.30	20.0	40.0	ug/Kg
179601-23-1	m/p-Xylenes	40.0	U	17.4	40.0	80.0	ug/Kg
95-47-6	o-Xylene	20.0	U	8.00	20.0	40.0	ug/Kg
100-42-5	Styrene	20.0	U	11.0	20.0	40.0	ug/Kg
75-25-2	Bromoform	32.0	U	9.60	32.0	40.0	ug/Kg
98-82-8	Isopropylbenzene	20.0	U	9.10	20.0	40.0	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	20.0	U	8.50	20.0	40.0	ug/Kg
541-73-1	1,3-Dichlorobenzene	20.0	U	10.3	20.0	40.0	ug/Kg
106-46-7	1,4-Dichlorobenzene	20.0	U	6.80	20.0	40.0	ug/Kg
95-50-1	1,2-Dichlorobenzene	32.0	U	8.30	32.0	40.0	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	62.1		71 - 136		124%	SPK: 50
1868-53-7	Dibromofluoromethane	54.3		78 - 119		109%	SPK: 50
2037-26-5	Toluene-d8	52.6		85 - 116		105%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.3		79 - 119		105%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	299000	7.8				
540-36-3	1,4-Difluorobenzene	487000	8.69				
3114-55-4	Chlorobenzene-d5	447000	11.49				
3855-82-1	1,4-Dichlorobenzene-d4	221000	13.42				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Appendix C

Support Documents

A. Documents Supporting Qualifications

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Appendix C

Support Documents

B. Chain of Custody (COC)

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CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax: (908) 78-8922
www.chemtech.net

Chemtech Project Number:

L2443

COC Number:

Table with 3 columns: CLIENT INFORMATION, PROJECT INFORMATION, BILLING INFORMATION. Includes fields for company name, address, project name, and contact details.

Table with 3 columns: DATA TURNAROUND INFORMATION, DATA DELIVERABLE INFORMATION, ANALYSIS. Includes fields for turnaround time, analysis options, and analysis results grid.

Main data table with columns: CHEMTECH SAMPLE ID, PROJECT SAMPLE IDENTIFICATION, SAMPLE MATRIX, SAMPLE TYPE, SAMPLE COLLECTION (DATE, TIME), # of Bottles, PRESERVATIVES, and COMMENTS. Contains 10 rows of sample data.

Table for SAMPLE CUSTODY documentation. Includes fields for Relinquished By, Date/Time, Received By, and Conditions of bottles or coolers at receipt. Includes handwritten signatures and dates.

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

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Appendix C

Support Documents

C. Calculations for Stage 4 Data Validation

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SDG L2443

Verification calculations follow the written formula with the verification results compared to the reported value, verification value vs. reported value.

VOC (8260) SAMPLE QUANTITATION

trichloroethene for BP-VPB180-GW-738-740

$$\text{Cpd. Concentration} = \frac{(\text{Area}_c)(\text{Conc}_{istd})(Vf)(DL)}{(\text{Area}_{st})(RRF_c)(Vi)}$$

Calc. Concentration = 14.8

AREA c	AREA st	CONC istd	RRF	Vf	Vi	DL
18626	156113	50	0.403	5000	5000	1

Reported Concentration = 14.8

VALIDATA

Chemical Services, Inc.

2159 Wynnton Pointe, Duluth, GA 30097

(770) 232-0130

(770) 232-5082 (Fax)

www.datavalidator.com

DATA VALIDATION SUMMARY REPORT - CHEMISTRY

COMPANY: Tetra Tech, Inc., Norfolk, VA
PROJECT NAME: Basewide Groundwater Investigation, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, N62470-16-D-9008
SITE NAME: CTO-WE13
CONTRACTED LAB: CHEMTECH, Mountainside, NJ
JOB NO./ACCOUNTING CODE: 112G08005-WE13
QA/QC LEVEL: EPA Stage 4
ANALYTICAL METHOD(S): SW846 Methods 8260C
VALIDATION GUIDELINES: Tier II Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Installation Program Site 0001 – Former Drum Marshalling Area Operable Unit 2 Plume Naval Weapons Industrial Reserve Plant Bethpage, New York, March 2019, DOD QSM 5.0; July 2013, DOD Data Validation Guidance, February 2018, Method criteria, Laboratory limits and Professional Judgment
SAMPLE MATRICES: Soil and Groundwater
TYPES OF ANALYSES: Volatile Organic Compounds (VOC)
DATA VALIDATION DATE: June 16, 2020
DATA REVIEWER(S): Amy L. Hogan
SDG NUMBER: L2468
SAMPLING DATE(S): April 29-30, 2020

SAMPLES:

<u>Client Sample ID</u>	<u>Laboratory ID</u>	<u>VOC</u>
BP-VPB180-GW-778-780	L2468-01	X
BP-VPB180-TB-20200429	L2468-02	X
BP-VPB180-GW-768-770	L2468-03	X
BP-VPB180-DUP-20200429	L2468-04	X
BP-VPB180-GW-803-805	L2468-05	X
BP-VPB180-GW-803-805MS	L2468-06	X
BP-VPB180-GW-803-805MSD	L2468-07	X
BP-VPB180-EB-20200430	L2468-08	X

Suffix Codes: DL= DILUTION, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA VALIDATION SUMMARY

CHEMTECH – SDG: L2468 – Organic Chemistry

VOLATILE ORGANICS

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW846 Method 8260C.

II.) Overall Assessment of Data:

All laboratory data were acceptable with qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

The Percent Difference (%D) for the standards run on 5/1/20 at 10:43 on instrument MSVOA_N for bromomethane (-21.33%) exceeded the 20% QC limit. The results for this compound in the water samples for this SDG, which consisted entirely of non-detects, were qualified as estimated (UJ) with reason code C.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks for this SDG. No data qualification was necessary.

Equipment and Rinsate Blanks:

There were no detections in associated equipment blank BP-VPB-EB-20200430. No data qualification was necessary.

Field Blank:

There were no associated field blanks for this SDG. No data qualification was necessary.

Trip Blank:

There were no detections in associated trip blank BP-VPB180-TB-20200429. No data qualification was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS and one LCS / LCSD set were analyzed by the laboratory for this SDG. All criteria were met. No data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were performed using sample BP-VPB180-GW-803-805. All criteria were met. No data qualification was necessary.

VIII.) Field Duplicates:

One set of field duplicate samples (BP-VPB180-GW-768-770 / BP-VPB180-DUP20200429) was identified as part of this SDG. The calculable Relative Percent Difference (RPD) for trichloroethene (0.7%) was within the QC limit and the calculable differences for 1,1-dichloroethene, acetone and chloroform were all less than 2X the LOQ, so no data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All forty-three requested compounds for groundwater samples and all forty-four requested compounds for soil samples were reported with acceptable LOD and LOQ results as determined by the SAP.

The validator has noted that the non-detect results for the following compounds were reported at the LOD, which exceeds the PAL limit of 0.17 ug/L for the groundwater samples : carbon disulfide, carbon tetrachloride, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene , 1,1,2,2-tetrachloroethane, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene and 1,1,2-trichlorotrifluoroethane.

The validator has noted that the non-detect results for vinyl chloride in all groundwater samples were reported at the LOD, which exceeds the PAL limit of 0.67 ug/L.

XII.) Sample Calculation Verification (Stage 4):

No discrepancies were noted in the sample calculation verification process.

Appendix A

Data Qualification Summary Table (DQST) with Qualification Codes

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DATA QUALIFICATION SUMMARY TABLE (DQST) WITH QUALIFICATION CODES

VOC								
Client Sample ID	Date Collected	Lab Sample ID	Analyte	Lab Qual	Val Result	VAL_RES ERROR	Val Qual	Val Reason
BP-VPB180-DUP-20200429	4/29/2020 0:00	L2468-04	BROMOMETHANE	U	3.8		UJ	C
BP-VPB180-EB-20200430	4/30/2020 0:00	L2468-08	BROMOMETHANE	U	3.8		UJ	C
BP-VPB180-GW-768-770	4/29/2020 0:00	L2468-03	BROMOMETHANE	U	3.8		UJ	C
BP-VPB180-GW-803-805	4/30/2020 0:00	L2468-05	BROMOMETHANE	U	3.8		UJ	C
BP-VPB180-TB-20200429	4/29/2020 0:00	L2468-02	BROMOMETHANE	U	3.8		UJ	C

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Appendix B

Laboratory Sample Results

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Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/29/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-TB-20200429	SDG No.:	L2468
Lab Sample ID:	L2468-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061227.D	1		05/01/20 13:58	VN050120

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/29/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-TB-20200429	SDG No.:	L2468
Lab Sample ID:	L2468-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061227.D	1		05/01/20 13:58	VN050120

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	48.2		81 - 118		96%	SPK: 50
1868-53-7	Dibromofluoromethane	48.8		80 - 119		98%	SPK: 50
2037-26-5	Toluene-d8	50.9		89 - 112		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	49.0		85 - 114		98%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	128000	7.63				
540-36-3	1,4-Difluorobenzene	230000	8.55				
3114-55-4	Chlorobenzene-d5	213000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	90200	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/29/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-GW-768-770	SDG No.:	L2468
Lab Sample ID:	L2468-03	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061230.D	1		05/01/20 15:08	VN050120

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	1.10	J	0.27	0.50	5.00	ug/L
67-64-1	Acetone	4.40	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.47	J	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	46.3		0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/29/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-GW-768-770	SDG No.:	L2468
Lab Sample ID:	L2468-03	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061230.D	1		05/01/20 15:08	VN050120

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	49.1		81 - 118		98%	SPK: 50
1868-53-7	Dibromofluoromethane	49.7		80 - 119		99%	SPK: 50
2037-26-5	Toluene-d8	51.6		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	50.8		85 - 114		102%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	117000	7.63				
540-36-3	1,4-Difluorobenzene	207000	8.55				
3114-55-4	Chlorobenzene-d5	198000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	87900	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/29/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-DUP-20200429	SDG No.:	L2468
Lab Sample ID:	L2468-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061231.D	1		05/01/20 15:31	VN050120

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.98	J	0.27	0.50	5.00	ug/L
67-64-1	Acetone	5.60	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.44	J	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	46.6		0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/29/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-DUP-20200429	SDG No.:	L2468
Lab Sample ID:	L2468-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061231.D	1		05/01/20 15:31	VN050120

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	48.6		81 - 118		97%	SPK: 50
1868-53-7	Dibromofluoromethane	49.4		80 - 119		99%	SPK: 50
2037-26-5	Toluene-d8	51.8		89 - 112		104%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.2		85 - 114		102%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	112000	7.63				
540-36-3	1,4-Difluorobenzene	199000	8.55				
3114-55-4	Chlorobenzene-d5	191000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	83700	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/30/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-GW-803-805	SDG No.:	L2468
Lab Sample ID:	L2468-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061232.D	1		05/01/20 15:54	VN050120

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	5.70	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/30/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-GW-803-805	SDG No.:	L2468
Lab Sample ID:	L2468-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061232.D	1		05/01/20 15:54	VN050120

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	49.6		81 - 118		99%	SPK: 50
1868-53-7	Dibromofluoromethane	50.3		80 - 119		101%	SPK: 50
2037-26-5	Toluene-d8	51.8		89 - 112		104%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.4		85 - 114		103%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	107000	7.63				
540-36-3	1,4-Difluorobenzene	188000	8.55				
3114-55-4	Chlorobenzene-d5	181000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	80200	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/30/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-EB-20200430	SDG No.:	L2468
Lab Sample ID:	L2468-08	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061228.D	1		05/01/20 14:21	VN050120

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/30/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-EB-20200430	SDG No.:	L2468
Lab Sample ID:	L2468-08	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN061228.D	1		05/01/20 14:21	VN050120

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	48.5		81 - 118		97%	SPK: 50
1868-53-7	Dibromofluoromethane	46.4		80 - 119		93%	SPK: 50
2037-26-5	Toluene-d8	51.6		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	50.1		85 - 114		100%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	119000	7.63				
540-36-3	1,4-Difluorobenzene	211000	8.55				
3114-55-4	Chlorobenzene-d5	201000	11.38				
3855-82-1	1,4-Dichlorobenzene-d4	88500	13.32				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/29/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-GW-778-780	SDG No.:	L2468
Lab Sample ID:	L2468-01	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	89.7
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002545.D	1		05/04/20 16:47	VY050420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	24.3	U	14.2	24.3	48.5	ug/Kg
74-87-3	Chloromethane	38.8	U	21.6	38.8	48.5	ug/Kg
75-01-4	Vinyl Chloride	24.3	U	13.4	24.3	48.5	ug/Kg
74-83-9	Bromomethane	24.3	U	12.7	24.3	48.5	ug/Kg
75-00-3	Chloroethane	24.3	U	15.9	24.3	48.5	ug/Kg
75-69-4	Trichlorofluoromethane	24.3	U	14.5	24.3	48.5	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	24.3	U	16.0	24.3	48.5	ug/Kg
75-35-4	1,1-Dichloroethene	24.3	U	13.8	24.3	48.5	ug/Kg
67-64-1	Acetone	140	J	59.1	190	240	ug/Kg
75-15-0	Carbon Disulfide	24.3	U	9.50	24.3	48.5	ug/Kg
1634-04-4	Methyl tert-butyl Ether	38.8	U	13.8	38.8	48.5	ug/Kg
75-09-2	Methylene Chloride	77.7	U	55.4	77.7	97.1	ug/Kg
156-60-5	trans-1,2-Dichloroethene	38.8	U	15.4	38.8	48.5	ug/Kg
75-34-3	1,1-Dichloroethane	24.3	U	9.20	24.3	48.5	ug/Kg
78-93-3	2-Butanone	190	U	80.6	190	240	ug/Kg
56-23-5	Carbon Tetrachloride	24.3	U	8.60	24.3	48.5	ug/Kg
156-59-2	cis-1,2-Dichloroethene	24.3	U	13.5	24.3	48.5	ug/Kg
67-66-3	Chloroform	24.3	U	12.4	24.3	48.5	ug/Kg
71-55-6	1,1,1-Trichloroethane	24.3	U	7.40	24.3	48.5	ug/Kg
108-87-2	Methylcyclohexane	24.3	U	4.50	24.3	48.5	ug/Kg
71-43-2	Benzene	24.3	U	8.30	24.3	48.5	ug/Kg
107-06-2	1,2-Dichloroethane	24.3	U	8.80	24.3	48.5	ug/Kg
79-01-6	Trichloroethene	24.3	U	8.20	24.3	48.5	ug/Kg
78-87-5	1,2-Dichloropropane	24.3	U	8.60	24.3	48.5	ug/Kg
75-27-4	Bromodichloromethane	24.3	U	8.70	24.3	48.5	ug/Kg
108-10-1	4-Methyl-2-Pentanone	120	U	67.8	120	240	ug/Kg
108-88-3	Toluene	24.3	U	8.30	24.3	48.5	ug/Kg
10061-02-6	t-1,3-Dichloropropene	24.3	U	10.4	24.3	48.5	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	24.3	U	9.50	24.3	48.5	ug/Kg
79-00-5	1,1,2-Trichloroethane	38.8	U	9.60	38.8	48.5	ug/Kg
591-78-6	2-Hexanone	190	U	85.7	190	240	ug/Kg
124-48-1	Dibromochloromethane	24.3	U	10.3	24.3	48.5	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	04/29/20
Project:	CTO WE13	Date Received:	05/01/20
Client Sample ID:	BP-VPB180-GW-778-780	SDG No.:	L2468
Lab Sample ID:	L2468-01	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	89.7
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002545.D	1		05/04/20 16:47	VY050420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	24.3	U	8.50	24.3	48.5	ug/Kg
108-90-7	Chlorobenzene	24.3	U	8.70	24.3	48.5	ug/Kg
100-41-4	Ethyl Benzene	24.3	U	10.0	24.3	48.5	ug/Kg
179601-23-1	m/p-Xylenes	48.5	U	21.1	48.5	97.1	ug/Kg
95-47-6	o-Xylene	24.3	U	9.70	24.3	48.5	ug/Kg
100-42-5	Styrene	24.3	U	13.4	24.3	48.5	ug/Kg
75-25-2	Bromoform	38.8	U	11.7	38.8	48.5	ug/Kg
98-82-8	Isopropylbenzene	24.3	U	11.0	24.3	48.5	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	24.3	U	10.4	24.3	48.5	ug/Kg
541-73-1	1,3-Dichlorobenzene	24.3	U	12.5	24.3	48.5	ug/Kg
106-46-7	1,4-Dichlorobenzene	24.3	U	8.30	24.3	48.5	ug/Kg
95-50-1	1,2-Dichlorobenzene	38.8	U	10.1	38.8	48.5	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	64.8		71 - 136		130%	SPK: 50
1868-53-7	Dibromofluoromethane	54.9		78 - 119		110%	SPK: 50
2037-26-5	Toluene-d8	52.5		85 - 116		105%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.9		79 - 119		108%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	305000	7.8				
540-36-3	1,4-Difluorobenzene	496000	8.69				
3114-55-4	Chlorobenzene-d5	459000	11.49				
3855-82-1	1,4-Dichlorobenzene-d4	234000	13.42				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Appendix C

Support Documents

A. Documents Supporting Qualifications

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VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CHEMTECH Contract: TETRO6
 Lab Code: CHEM Case No.: L2468 SAS No.: L2468 SDG No.: L2468
 Instrument ID: MSVOA_N Calibration Date/Time: 05/01/2020 10:43
 Lab File ID: VN061220.D Init. Calib. Date(s): 04/27/2020 04/27/2020
 Heated Purge: (Y/N) N Init. Calib. Time(s): 15:39 17:58
 GC Column: RXI-624 ID: 0.25 (mm)

COMPOUND	RRF	RRF050	MIN RRF	%D	MAX%D
Chloromethane	0.642	0.731	0.1	13.86	20
Vinyl Chloride	0.729	0.679		-6.86	20
Bromomethane	0.361	0.284		-21.33	20
Chloroethane	0.462	0.396		-14.29	20
Trichlorofluoromethane	0.823	0.826		0.37	20
1,1,2-Trichlorotrifluoroethane	0.530	0.532		0.38	20
1,1-Dichloroethene	0.528	0.521		-1.33	20
Acetone	0.398	0.320		-19.6	20
Carbon Disulfide	1.457	1.364		-6.38	20
Methyl tert-butyl Ether	2.016	2.051		1.74	20
Methylene Chloride	0.617	0.629		1.95	20
trans-1,2-Dichloroethene	0.574	0.570		-0.7	20
1,1-Dichloroethane	1.185	1.209	0.1	2.03	20
2-Butanone	0.468	0.479		2.35	20
Carbon Tetrachloride	0.400	0.408		2	20
cis-1,2-Dichloroethene	0.674	0.669		-0.74	20
Chloroform	1.201	1.131		-5.83	20
1,1,1-Trichloroethane	1.046	0.946		-9.56	20
Methylcyclohexane	0.561	0.573		2.14	20
Benzene	1.491	1.525		2.28	20
1,2-Dichloroethane	0.565	0.561		-0.71	20
Trichloroethene	0.403	0.380		-5.71	20
1,2-Dichloropropane	0.398	0.421		5.78	20
Bromodichloromethane	0.529	0.540		2.08	20
4-Methyl-2-Pentanone	0.573	0.603		5.24	20
Toluene	0.898	0.912		1.56	20
t-1,3-Dichloropropene	0.597	0.625		4.69	20
cis-1,3-Dichloropropene	0.631	0.666		5.55	20
1,1,2-Trichloroethane	0.358	0.364		1.68	20
2-Hexanone	0.417	0.434		4.08	20
Dibromochloromethane	0.375	0.374		-0.27	20
Tetrachloroethene	0.433	0.410		-5.31	20
Chlorobenzene	0.992	0.995	0.3	0.3	20
Ethyl Benzene	1.857	1.906		2.64	20
m/p-Xylenes	0.680	0.695		2.21	20
o-Xylene	0.653	0.660		1.07	20
Styrene	1.093	1.129		3.29	20
Bromoform	0.261	0.272	0.1	4.22	20
Isopropylbenzene	3.676	3.782		2.88	20

All other compounds must meet a minimum RRF of 0.010.
 RRF of 1,4-Dioxane = Value should be divide by 1000.

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CHEMTECH Contract: TETRO6
 Lab Code: CHEM Case No.: L2468 SAS No.: L2468 SDG No.: L2468
 Instrument ID: MSVOA_N Calibration Date/Time: 05/01/2020 10:43
 Lab File ID: VN061220.D Init. Calib. Date(s): 04/27/2020 04/27/2020
 Heated Purge: (Y/N) N Init. Calib. Time(s): 15:39 17:58
 GC Column: RXI-624 ID: 0.25 (mm)

COMPOUND	RRF	RRF050	MIN RRF	%D	MAX%D
1,1,2,2-Tetrachloroethane	1.146	1.208	0.3	5.41	20
1,3-Dichlorobenzene	1.562	1.592		1.92	20
1,4-Dichlorobenzene	1.596	1.604		0.5	20
1,2-Dichlorobenzene	1.498	1.519		1.4	20
1,2-Dichloroethane-d4	0.791	0.700		-11.5	20
Dibromofluoromethane	0.296	0.273		-7.77	20
Toluene-d8	1.205	1.140		-5.39	20
4-Bromofluorobenzene	0.454	0.429		-5.51	20

All other compounds must meet a minimum RRF of 0.010.
 RRF of 1,4-Dioxane = Value should be divide by 1000.

Appendix C

Support Documents

B. Chain of Custody (COC)

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CLIENT INFORMATION

PROJECT INFORMATION

BILLING INFORMATION

COMPANY: Tetra Tech
ADDRESS: 5700 Lake Wright Dr., Suite 102
CITY: Norfolk STATE: VA ZIP: 23502
ATTENTION: Dave Brayack
PHONE: 757-466-4909 FAX: 757-461-4148

PROJECT NAME: NWIRP Bethpage
PROJECT #: 112G08005-WE13 LOCATION: VPB-180
PROJECT MANAGER: Dave Brayack
E-MAIL: david.brayack@tetratech.com
PHONE: 757-466-4909 FAX: 757-461-4148

BILL TO: SEE CONTRACT PO#
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

DATA DELIVERABLE INFORMATION

FAX: 2 DAYS*
HARD COPY: 2 DAYS*
EDD 2 DAYS*
* TO BE APPROVED BY CHEMTECH
STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

RESEULTS ONLY USEPA CLP
 RESULTS + QC New York State ASP "B"
 New Jersey REDUCED New York State ASP "A"
 New Jersey CLP Other _____
 EDD Format _____

ANALYSIS

VOC(SW846-8260E)									
	1	2	3	4	5	6	7	8	9

PRESERVATIVES

COMMENTS

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# of Bottles	PRESERVATIVES									COMMENTS <-- Specify Preservatives A-HCl B-HNO3 C-H2SO4 D-NaOH E-ICE F-Other	
			COMP	GRAB	DATE	TIME		A										
1.	BP-VPB180-TB-20200429	AQ		X	4/29/20	8:00	2	2										
2.	BP-VPB180-GW-768-770	AQ		X	4/29/20	12:30	3	3										Very turbid
3.	BP-VPB180-GW-778-780	AQ		X	4/29/20	14:49	11	11										Very turbid
4.	BP-VPB180-DUP-20200429	AQ		X	4/29/20	11:00	4	4										
5.	BP-VPB180-GW-803-805	AQ		X	4/30/20	12:34	6	6										Run MS/MSD
6.	BP-VPB180-EB-20200430	AQ		X	4/30/20	12:00	2	2										
7.																		
8.																		
9.																		
10.																		

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER <i>[Signature]</i>	DATE/TIME 4/30/20	RECEIVED BY 1. <i>[Signature]</i>	Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Cooler Temp <u>2.3</u> MeOH extraction requires an additional 4oz. Jar for percent solid <input type="checkbox"/> Ice in Cooler? <u>yes</u> Comments: 48hr TAT - For VOC's see worksheet #15 of SAP 2018 for VPB program VOC list
RELINQUISHED BY 2. <i>[Signature]</i>	DATE/TIME 5-1-20	RECEIVED BY 2. <i>[Signature]</i>	
RELINQUISHED BY 3. <i>[Signature]</i>	DATE/TIME	RECEIVED FOR LAB BY	

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Appendix C

Support Documents

C. Calculations for Stage 4 Data Validation

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SDG L2468

Verification calculations follow the written formula with the verification results compared to the reported value, verification value vs. reported value.

VOC (8260) SAMPLE QUANTITATION

trichloroethene for BP-VPB180-DUP-20200429

$$\text{Cpd. Concentration} = \frac{(\text{Area}_c)(\text{Conc}_{istd})(V_f)(DL)}{(\text{Area}_{st})(RRF_c)(V_i)}$$

Calc. Concentration = 46.6

AREA c	AREA st	CONC istd	RRF	Vf	Vi	DL
74558	198534	50	0.403	5000	5000	1

Reported Concentration = 46.6

VALIDATA

Chemical Services, Inc.

2159 Wynnton Pointe, Duluth, GA 30097

(770) 232-0130

(770) 232-5082 (Fax)

www.datavalidator.com

DATA VALIDATION SUMMARY REPORT - CHEMISTRY

COMPANY: Tetra Tech, Inc., Norfolk, VA
PROJECT NAME: Basewide Groundwater Investigation, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, N62470-16-D-9008
SITE NAME: CTO-WE13
CONTRACTED LAB: CHEMTECH, Mountainside, NJ
JOB NO./ACCOUNTING CODE: 112G08005-WE13
QA/QC LEVEL: EPA Stage 4
ANALYTICAL METHOD(S): SW846 Methods 8260C
VALIDATION GUIDELINES: Tier II Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Installation Program Site 0001 – Former Drum Marshalling Area Operable Unit 2 Plume Naval Weapons Industrial Reserve Plant Bethpage, New York, March 2019, DOD QSM 5.0; July 2013, DOD Data Validation Guidance, February 2018, Method criteria, Laboratory limits and Professional Judgment
SAMPLE MATRICES: Soil and Groundwater
TYPES OF ANALYSES: Volatile Organic Compounds (VOC)
DATA VALIDATION DATE: June 16, 2020
DATA REVIEWER(S): Amy L. Hogan
SDG NUMBER: L2508
SAMPLING DATE(S): May 1-4, 2020

SAMPLES:

<u>Client Sample ID</u>	<u>Laboratory ID</u>	<u>VOC</u>
BP-VPB180-TB-20200501	L2508-01	X
BP-VPB180-EB-20200504	L2508-02	X
BP-VPB180-GW-858-860	L2508-04	X
BP-VPB180-GW-878-880	L2508-05	X
BP-VPB180-GW-838-840	L2508-06	X

Suffix Codes: DL= DILUTION, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA VALIDATION SUMMARY

CHEMTECH – SDG: L2508 – Organic Chemistry

VOLATILE ORGANICS

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW846 Method 8260C.

II.) Overall Assessment of Data:

All laboratory data were acceptable with qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No data qualification was necessary.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks for this SDG. No data qualification was necessary.

Equipment and Rinsate Blanks:

Chloromethane (0.30 ug/L) and acetone (1.70 ug/) were detected in associated equipment blank BP-VPB-EB-20200504. Since the blank result for acetone was less than the LOQ, all positive acetone results for the samples, which were less than the LOQ, were qualified as undetected (U) with result being raised to the LOQ and reason code B. Since there were no positive results for chloromethane in the SDG samples, no data qualification was necessary.

Field Blank:

There were no associated field blanks for this SDG. No data qualification was necessary.

Trip Blank:

There were no detections in associated trip blank BP-VPB180-TB-20200501. No data qualification was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS and one LCS / LCSD set were analyzed by the laboratory for this SDG. All criteria were met. No data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

Batch MS / MSD analyses data were submitted for this SDG. All criteria were met. No data qualification was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples identified as part of this SDG. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All forty-three requested compounds for groundwater samples and all forty-four requested compounds for soil samples were reported with acceptable LOD and LOQ results as determined by the SAP.

The validator has noted that the non-detect results for the following compounds were reported at the LOD, which exceeds the PAL limit of 0.17 ug/L for the groundwater samples : carbon disulfide, carbon tetrachloride, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene , 1,1,2,2-tetrachloroethane, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene and 1,1,2-trichlorotrifluoroethane.

The validator has noted that the non-detect results for vinyl chloride in all groundwater samples were reported at the LOD, which exceeds the PAL limit of 0.67 ug/L.

XII.) Sample Calculation Verification (Stage 4):

No discrepancies were noted in the sample calculation verification process.

Appendix A

Data Qualification Summary Table (DQST) with Qualification Codes

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DATA QUALIFICATION SUMMARY TABLE (DQST) WITH QUALIFICATION CODES

VOC								
Client Sample ID	Date Collected	Lab Sample ID	Analyte	Lab Qual	Val Result	VAL_RES ERROR	Val Qual	Val Reason
BP-VPB180-GW-838-840	5/1/2020 0:00	L2508-06	ACETONE	J	64.6	150.0	U	B
BP-VPB180-GW-858-860	5/4/2020 0:00	L2508-04	ACETONE	J	3.3	25.0	U	B
BP-VPB180-GW-878-880	5/4/2020 0:00	L2508-05	ACETONE	J	3.1	25.0	U	B

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Appendix B

Laboratory Sample Results

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Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/01/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-TB-20200501	SDG No.:	L2508
Lab Sample ID:	L2508-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016060.D	1		05/05/20 13:49	VX050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/01/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-TB-20200501	SDG No.:	L2508
Lab Sample ID:	L2508-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016060.D	1		05/05/20 13:49	VX050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	46.7		81 - 118		93%	SPK: 50
1868-53-7	Dibromofluoromethane	46.1		80 - 119		92%	SPK: 50
2037-26-5	Toluene-d8	50.0		89 - 112		100%	SPK: 50
460-00-4	4-Bromofluorobenzene	52.3		85 - 114		105%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	303000	5.64				
540-36-3	1,4-Difluorobenzene	496000	6.84				
3114-55-4	Chlorobenzene-d5	475000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	250000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/04/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-EB-20200504	SDG No.:	L2508
Lab Sample ID:	L2508-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016062.D	1		05/05/20 14:34	VX050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.30	J	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	1.70	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/04/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-EB-20200504	SDG No.:	L2508
Lab Sample ID:	L2508-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016062.D	1		05/05/20 14:34	VX050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	47.4		81 - 118		95%	SPK: 50
1868-53-7	Dibromofluoromethane	45.8		80 - 119		92%	SPK: 50
2037-26-5	Toluene-d8	49.9		89 - 112		100%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.3		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	306000	5.64				
540-36-3	1,4-Difluorobenzene	507000	6.84				
3114-55-4	Chlorobenzene-d5	488000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	255000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/04/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-GW-858-860	SDG No.:	L2508
Lab Sample ID:	L2508-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016067.D	1		05/05/20 16:28	VX050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	3.30	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/04/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-GW-858-860	SDG No.:	L2508
Lab Sample ID:	L2508-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016067.D	1		05/05/20 16:28	VX050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	46.9		81 - 118		94%	SPK: 50
1868-53-7	Dibromofluoromethane	46.8		80 - 119		94%	SPK: 50
2037-26-5	Toluene-d8	50.4		89 - 112		101%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.6		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	295000	5.64				
540-36-3	1,4-Difluorobenzene	480000	6.84				
3114-55-4	Chlorobenzene-d5	470000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	248000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/04/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-GW-878-880	SDG No.:	L2508
Lab Sample ID:	L2508-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016068.D	1		05/05/20 16:51	VX050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	3.10	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/04/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-GW-878-880	SDG No.:	L2508
Lab Sample ID:	L2508-05	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016068.D	1		05/05/20 16:51	VX050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	47.6		81 - 118		95%	SPK: 50
1868-53-7	Dibromofluoromethane	46.3		80 - 119		93%	SPK: 50
2037-26-5	Toluene-d8	49.8		89 - 112		100%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.7		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	285000	5.64				
540-36-3	1,4-Difluorobenzene	474000	6.84				
3114-55-4	Chlorobenzene-d5	464000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	243000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 E = Value Exceeds Calibration Range
 Q = indicates LCS control criteria did not meet requirements
 M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 N = Presumptive Evidence of a Compound
 * = Values outside of QC limits
 D = Dilution
 () = Laboratory InHouse Limit
 A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/01/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-GW-838-840	SDG No.:	L2508
Lab Sample ID:	L2508-06	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	83.5
Sample Wt/Vol:	5.02 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002585.D	1		05/05/20 14:44	VY050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	15.1	U	8.80	15.1	30.2	ug/Kg
74-87-3	Chloromethane	24.1	U	13.4	24.1	30.2	ug/Kg
75-01-4	Vinyl Chloride	15.1	U	8.40	15.1	30.2	ug/Kg
74-83-9	Bromomethane	15.1	U	7.90	15.1	30.2	ug/Kg
75-00-3	Chloroethane	15.1	U	9.90	15.1	30.2	ug/Kg
75-69-4	Trichlorofluoromethane	15.1	U	9.00	15.1	30.2	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	15.1	U	9.90	15.1	30.2	ug/Kg
75-35-4	1,1-Dichloroethene	15.1	U	8.60	15.1	30.2	ug/Kg
67-64-1	Acetone	64.6	J	36.7	120	150	ug/Kg
75-15-0	Carbon Disulfide	15.1	U	5.90	15.1	30.2	ug/Kg
1634-04-4	Methyl tert-butyl Ether	24.1	U	8.60	24.1	30.2	ug/Kg
75-09-2	Methylene Chloride	48.3	U	34.5	48.3	60.4	ug/Kg
156-60-5	trans-1,2-Dichloroethene	24.1	U	9.60	24.1	30.2	ug/Kg
75-34-3	1,1-Dichloroethane	15.1	U	5.70	15.1	30.2	ug/Kg
78-93-3	2-Butanone	120	U	50.1	120	150	ug/Kg
56-23-5	Carbon Tetrachloride	15.1	U	5.40	15.1	30.2	ug/Kg
156-59-2	cis-1,2-Dichloroethene	15.1	U	8.40	15.1	30.2	ug/Kg
67-66-3	Chloroform	15.1	U	7.70	15.1	30.2	ug/Kg
71-55-6	1,1,1-Trichloroethane	15.1	U	4.60	15.1	30.2	ug/Kg
108-87-2	Methylcyclohexane	15.1	U	2.80	15.1	30.2	ug/Kg
71-43-2	Benzene	15.1	U	5.20	15.1	30.2	ug/Kg
107-06-2	1,2-Dichloroethane	15.1	U	5.50	15.1	30.2	ug/Kg
79-01-6	Trichloroethene	15.1	U	5.10	15.1	30.2	ug/Kg
78-87-5	1,2-Dichloropropane	15.1	U	5.30	15.1	30.2	ug/Kg
75-27-4	Bromodichloromethane	15.1	U	5.40	15.1	30.2	ug/Kg
108-10-1	4-Methyl-2-Pentanone	75.5	U	42.1	75.5	150	ug/Kg
108-88-3	Toluene	15.1	U	5.20	15.1	30.2	ug/Kg
10061-02-6	t-1,3-Dichloropropene	15.1	U	6.50	15.1	30.2	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	15.1	U	5.90	15.1	30.2	ug/Kg
79-00-5	1,1,2-Trichloroethane	24.1	U	6.00	24.1	30.2	ug/Kg
591-78-6	2-Hexanone	120	U	53.3	120	150	ug/Kg
124-48-1	Dibromochloromethane	15.1	U	6.40	15.1	30.2	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/01/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-GW-838-840	SDG No.:	L2508
Lab Sample ID:	L2508-06	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	83.5
Sample Wt/Vol:	5.02 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002585.D	1		05/05/20 14:44	VY050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	15.1	U	5.30	15.1	30.2	ug/Kg
108-90-7	Chlorobenzene	15.1	U	5.40	15.1	30.2	ug/Kg
100-41-4	Ethyl Benzene	15.1	U	6.20	15.1	30.2	ug/Kg
179601-23-1	m/p-Xylenes	30.2	U	13.1	30.2	60.4	ug/Kg
95-47-6	o-Xylene	15.1	U	6.00	15.1	30.2	ug/Kg
100-42-5	Styrene	15.1	U	8.30	15.1	30.2	ug/Kg
75-25-2	Bromoform	24.1	U	7.30	24.1	30.2	ug/Kg
98-82-8	Isopropylbenzene	15.1	U	6.90	15.1	30.2	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	15.1	U	6.40	15.1	30.2	ug/Kg
541-73-1	1,3-Dichlorobenzene	15.1	U	7.80	15.1	30.2	ug/Kg
106-46-7	1,4-Dichlorobenzene	15.1	U	5.10	15.1	30.2	ug/Kg
95-50-1	1,2-Dichlorobenzene	24.1	U	6.30	24.1	30.2	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	59.1		71 - 136		118%	SPK: 50
1868-53-7	Dibromofluoromethane	53.7		78 - 119		107%	SPK: 50
2037-26-5	Toluene-d8	52.3		85 - 116		105%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.3		79 - 119		103%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	337000	7.8				
540-36-3	1,4-Difluorobenzene	539000	8.7				
3114-55-4	Chlorobenzene-d5	486000	11.49				
3855-82-1	1,4-Dichlorobenzene-d4	239000	13.43				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Appendix C

Support Documents

A. Documents Supporting Qualifications

V@Áæ^Ác}á}á^Á-á|á\Á

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/04/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-EB-20200504	SDG No.:	L2508
Lab Sample ID:	L2508-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016062.D	1		05/05/20 14:34	VX050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.30	J	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	1.70	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/04/20
Project:	CTO WE13	Date Received:	05/05/20
Client Sample ID:	BP-VPB180-EB-20200504	SDG No.:	L2508
Lab Sample ID:	L2508-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016062.D	1		05/05/20 14:34	VX050520

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	47.4		81 - 118		95%	SPK: 50
1868-53-7	Dibromofluoromethane	45.8		80 - 119		92%	SPK: 50
2037-26-5	Toluene-d8	49.9		89 - 112		100%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.3		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	306000	5.64				
540-36-3	1,4-Difluorobenzene	507000	6.84				
3114-55-4	Chlorobenzene-d5	488000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	255000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Appendix C

Support Documents

B. Chain of Custody (COC)

V@Áæ^Ác}á}á^Á-á|á\Á



CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax: (908) 78-8922
www.chemtech.net

Chemtech Project Number: L2508

COC Number:

CLIENT INFORMATION	PROJECT INFORMATION	BILLING INFORMATION
COMPANY: Tetra Tech	PROJECT NAME: NWIRP Bethpage	BILL TO: SEE CONTRACT PO#
ADDRESS: 5700 Lake Wright Dr., Suite 102	PROJECT #: 112G08005-WE13 LOCATION: VPB-180	ADDRESS:
CITY: Norfolk STATE: VA ZIP: 23502	PROJECT MANAGER: Dave Brayack	CITY: STATE: ZIP:
ATTENTION: Dave Brayack	E-MAIL: david.brayack@tetratech.com	ATTENTION: PHONE:
PHONE: 757-466-4909 FAX: 757-461-4148	PHONE: 757-466-4909 FAX: 757-461-4148	

DATA TURNAROUND INFORMATION	DATA DELIVERABLE INFORMATION	ANALYSIS
FAX: _____ 2 _____ DAYS* HARD COPY: _____ 2 _____ DAYS* EDD _____ 2 _____ DAYS* * TO BE APPROVED BY CHEMTECH STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS	<input type="checkbox"/> RESULTS ONLY <input type="checkbox"/> USEPA CLP <input type="checkbox"/> RESULTS + QC <input type="checkbox"/> New York State ASP "B" <input type="checkbox"/> New Jersey REDUCED <input type="checkbox"/> New York State ASP "A" <input type="checkbox"/> New Jersey CLP <input type="checkbox"/> Other _____ <input type="checkbox"/> EDD Format _____	VOC(SW846-8260B) 1 2 3 4 5 6 7 8 9

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# of Bottles	PRESERVATIVES									COMMENTS ← Specify Preservatives A-HCl B-HNO3 C-H2SO4 D-NaOH E-ICE F-Other			
			COMP	GRAB	DATE	TIME		A												
			1	2	3	4		5	6	7	8	9								
1.	BP-VPB180-TB-20200501	AQ		X	5/1/20	8:00	2	2												
2.	BP-VPB180-EB-20200504	AQ		X	5/4/20	10:20	2	2												
3.	BP-VPB180-GW-838-840	AQ		X	5/1/20	13:58	3	3												Very turbid
4.	BP-VPB180-GW-858-860	AQ		X	5/4/20	10:12	2	2												
5.	BP-VPB180-GW-878-880	AQ		X	5/4/20	12:30	2	2												
6.																				
7.																				
8.																				
9.																				
10.																				

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE PROSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER <i>[Signature]</i>	DATE/TIME 5/1/20 16:00	RECEIVED BY 1. <i>[Signature]</i>	Conditions of bottles or coolers at receipt: <input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Cooler Temp <u>2.3</u> MeOH extraction requires an additional 4oz. Jar for percent solid <input checked="" type="checkbox"/> Ice in Cooler?: <u>yes</u> Comments: 48hr TAT - For VOC's see worksheet #15 of SAP 2018 for VPB program VOC list
RELINQUISHED BY 2. <i>[Signature]</i>	DATE/TIME 5-5-20 9:40	RECEIVED BY 2. <i>[Signature]</i>	
RELINQUISHED BY 3. <i>[Signature]</i>	DATE/TIME	RECEIVED FOR LAB BY 3. <i>[Signature]</i>	

Page 1 of 1 SHIPPED VIA: CLIENT: Hand Delivered Overnight
 CHEMTECH: Picked Up Overnight **Shipment Complete**
 YES NO

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

It. Gun #1

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Appendix C

Support Documents

C. Calculations for Stage 4 Data Validation

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SDG L2508

Verification calculations follow the written formula with the verification results compared to the reported value, verification value vs. reported value.

VOC (8260) SAMPLE QUANTITATION

acetone for BP-VPB180-EB-20200504

$$\text{Cpd. Concentration} = \frac{(\text{Area}_c)(\text{Conc}_{istd})(V_f)(DL)}{(\text{Area}_{st})(RRF_c)(V_i)}$$

Calc. Concentration = 1.7

AREA c	AREA st	CONC istd	RRF	Vf	Vi	DL
3090	305804	50	0.294	5000	5000	1

Reported Concentration = 1.7

VALIDATA

Chemical Services, Inc.

2159 Wynnton Pointe, Duluth, GA 30097

(770) 232-0130

(770) 232-5082 (Fax)

www.datavalidator.com

DATA VALIDATION SUMMARY REPORT - CHEMISTRY

COMPANY: Tetra Tech, Inc., Norfolk, VA
PROJECT NAME: Basewide Groundwater Investigation, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, N62470-16-D-9008
SITE NAME: CTO-WE13
CONTRACTED LAB: CHEMTECH, Mountainside, NJ
JOB NO./ACCOUNTING CODE: 112G08005-WE13
QA/QC LEVEL: EPA Stage 4
ANALYTICAL METHOD(S): SW846 Methods 8260C
VALIDATION GUIDELINES: Tier II Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Installation Program Site 0001 – Former Drum Marshalling Area Operable Unit 2 Plume Naval Weapons Industrial Reserve Plant Bethpage, New York, March 2019, DOD QSM 5.0; July 2013, DOD Data Validation Guidance, February 2018, Method criteria, Laboratory limits and Professional Judgment
SAMPLE MATRICES: Soil and Groundwater
TYPES OF ANALYSES: Volatile Organic Compounds (VOC)
DATA VALIDATION DATE: June 16, 2020
DATA REVIEWER(S): Amy L. Hogan
SDG NUMBER: L2546
SAMPLING DATE(S): May 5, 2020

SAMPLES:

<u>Client Sample ID</u>	<u>Laboratory ID</u>	<u>VOC</u>
BP-VPB180-GW-918-920	L2546-01	X
BP-VPB180-TB-20200505	L2546-02	X

Suffix Codes: DL= DILUTION, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA VALIDATION SUMMARY

CHEMTECH – SDG: L2546 – Organic Chemistry

VOLATILE ORGANICS

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW846 Method 8260C.

II.) Overall Assessment of Data:

All laboratory data were acceptable without qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No data qualification was necessary.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks for this SDG. No data qualification was necessary.

Equipment and Rinsate Blanks:

There was no associated equipment rinsate blank for this SDG. No data qualification was necessary.

Field Blank:

There were no associated field blanks for this SDG. No data qualification was necessary.

Trip Blank:

There were no detections in associated trip blank BP-VPB180-TB-20200505. No data qualification was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS and one LCS / LCSD set were analyzed by the laboratory for this SDG. All criteria were met. No data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

Batch MS / MSD analyses data were submitted for this SDG. All criteria were met. No data qualification was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples identified as part of this SDG. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All forty-three requested compounds for groundwater samples and all forty-four requested compounds for soil samples were reported with acceptable LOD and LOQ results as determined by the SAP.

The validator has noted that the non-detect results for the following compounds were reported at the LOD, which exceeds the PAL limit of 0.17 ug/L for the groundwater samples : carbon disulfide, carbon tetrachloride, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene , 1,1,2,2-tetrachloroethane, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene and 1,1,2-trichlorotrifluoroethane.

The validator has noted that the non-detect results for vinyl chloride in all groundwater samples were reported at the LOD, which exceeds the PAL limit of 0.67 ug/L.

XII.) Sample Calculation Verification (Stage 4):

No discrepancies were noted in the sample calculation verification process.

Appendix A

Data Qualification Summary Table (DQST) with Qualification Codes

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DATA QUALIFICATION SUMMARY TABLE (DQST) WITH QUALIFICATION CODES

Client Sample ID	Lab Sample ID	Date Collected	Analyte	Lab Qual	Val Result	Val Qual	Val Reason
N/A	N/A	N/A	N/A	No qualifications were made			

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Appendix B

Laboratory Sample Results

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Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/05/20
Project:	CTO WE13	Date Received:	05/07/20
Client Sample ID:	BP-VPB180-TB-20200505	SDG No.:	L2546
Lab Sample ID:	L2546-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016092.D	1		05/07/20 14:33	VX050720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/05/20
Project:	CTO WE13	Date Received:	05/07/20
Client Sample ID:	BP-VPB180-TB-20200505	SDG No.:	L2546
Lab Sample ID:	L2546-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX016092.D	1		05/07/20 14:33	VX050720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	45.8		81 - 118		92%	SPK: 50
1868-53-7	Dibromofluoromethane	46.8		80 - 119		94%	SPK: 50
2037-26-5	Toluene-d8	50.3		89 - 112		101%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.1		85 - 114		106%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	312000	5.64				
540-36-3	1,4-Difluorobenzene	500000	6.84				
3114-55-4	Chlorobenzene-d5	489000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	257000	12.07				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/05/20
Project:	CTO WE13	Date Received:	05/07/20
Client Sample ID:	BP-VPB180-GW-918-920	SDG No.:	L2546
Lab Sample ID:	L2546-01	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	77.8
Sample Wt/Vol:	5.06 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002630.D	1		05/07/20 14:44	VY050720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	11.1	U	6.50	11.1	22.3	ug/Kg
74-87-3	Chloromethane	17.8	U	9.90	17.8	22.3	ug/Kg
75-01-4	Vinyl Chloride	11.1	U	6.20	11.1	22.3	ug/Kg
74-83-9	Bromomethane	11.1	U	5.80	11.1	22.3	ug/Kg
75-00-3	Chloroethane	11.1	U	7.30	11.1	22.3	ug/Kg
75-69-4	Trichlorofluoromethane	11.1	U	6.70	11.1	22.3	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	11.1	U	7.30	11.1	22.3	ug/Kg
75-35-4	1,1-Dichloroethene	11.1	U	6.30	11.1	22.3	ug/Kg
67-64-1	Acetone	89.0	U	27.1	89.0	110	ug/Kg
75-15-0	Carbon Disulfide	11.1	U	4.30	11.1	22.3	ug/Kg
1634-04-4	Methyl tert-butyl Ether	17.8	U	6.30	17.8	22.3	ug/Kg
75-09-2	Methylene Chloride	35.6	U	25.4	35.6	44.5	ug/Kg
156-60-5	trans-1,2-Dichloroethene	17.8	U	7.10	17.8	22.3	ug/Kg
75-34-3	1,1-Dichloroethane	11.1	U	4.20	11.1	22.3	ug/Kg
78-93-3	2-Butanone	89.0	U	36.9	89.0	110	ug/Kg
56-23-5	Carbon Tetrachloride	11.1	U	4.00	11.1	22.3	ug/Kg
156-59-2	cis-1,2-Dichloroethene	11.1	U	6.20	11.1	22.3	ug/Kg
67-66-3	Chloroform	11.1	U	5.70	11.1	22.3	ug/Kg
71-55-6	1,1,1-Trichloroethane	11.1	U	3.40	11.1	22.3	ug/Kg
108-87-2	Methylcyclohexane	11.1	U	2.10	11.1	22.3	ug/Kg
71-43-2	Benzene	11.1	U	3.80	11.1	22.3	ug/Kg
107-06-2	1,2-Dichloroethane	11.1	U	4.10	11.1	22.3	ug/Kg
79-01-6	Trichloroethene	11.1	U	3.80	11.1	22.3	ug/Kg
78-87-5	1,2-Dichloropropane	11.1	U	3.90	11.1	22.3	ug/Kg
75-27-4	Bromodichloromethane	11.1	U	4.00	11.1	22.3	ug/Kg
108-10-1	4-Methyl-2-Pentanone	55.6	U	31.1	55.6	110	ug/Kg
108-88-3	Toluene	11.1	U	3.80	11.1	22.3	ug/Kg
10061-02-6	t-1,3-Dichloropropene	11.1	U	4.80	11.1	22.3	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	11.1	U	4.40	11.1	22.3	ug/Kg
79-00-5	1,1,2-Trichloroethane	17.8	U	4.40	17.8	22.3	ug/Kg
591-78-6	2-Hexanone	89.0	U	39.3	89.0	110	ug/Kg
124-48-1	Dibromochloromethane	11.1	U	4.70	11.1	22.3	ug/Kg

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	05/05/20
Project:	CTO WE13	Date Received:	05/07/20
Client Sample ID:	BP-VPB180-GW-918-920	SDG No.:	L2546
Lab Sample ID:	L2546-01	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	77.8
Sample Wt/Vol:	5.06 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VY002630.D	1		05/07/20 14:44	VY050720

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
127-18-4	Tetrachloroethene	11.1	U	3.90	11.1	22.3	ug/Kg
108-90-7	Chlorobenzene	11.1	U	4.00	11.1	22.3	ug/Kg
100-41-4	Ethyl Benzene	11.1	U	4.60	11.1	22.3	ug/Kg
179601-23-1	m/p-Xylenes	22.3	U	9.70	22.3	44.5	ug/Kg
95-47-6	o-Xylene	11.1	U	4.40	11.1	22.3	ug/Kg
100-42-5	Styrene	11.1	U	6.10	11.1	22.3	ug/Kg
75-25-2	Bromoform	17.8	U	5.40	17.8	22.3	ug/Kg
98-82-8	Isopropylbenzene	11.1	U	5.10	11.1	22.3	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	11.1	U	4.70	11.1	22.3	ug/Kg
541-73-1	1,3-Dichlorobenzene	11.1	U	5.70	11.1	22.3	ug/Kg
106-46-7	1,4-Dichlorobenzene	11.1	U	3.80	11.1	22.3	ug/Kg
95-50-1	1,2-Dichlorobenzene	17.8	U	4.60	17.8	22.3	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	58.0		71 - 136		116%	SPK: 50
1868-53-7	Dibromofluoromethane	53.4		78 - 119		107%	SPK: 50
2037-26-5	Toluene-d8	52.1		85 - 116		104%	SPK: 50
460-00-4	4-Bromofluorobenzene	51.4		79 - 119		103%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	346000	7.8				
540-36-3	1,4-Difluorobenzene	546000	8.69				
3114-55-4	Chlorobenzene-d5	493000	11.49				
3855-82-1	1,4-Dichlorobenzene-d4	239000	13.42				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/Kg

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Appendix C

Support Documents

A. Documents Supporting Qualifications

V@Áæ^Ác}á}á^Á-á|á\Á

Appendix C

Support Documents

B. Chain of Custody (COC)

V@Áæ^Ác}á}á^Á-á|á\Á



284 Sheffield Street, Mountainside, NJ 07092
 (908) 789-8900 Fax: (908) 78-8922
 www.chemtech.net

Chemtech Project Number: L2546
 COC Number:

CLIENT INFORMATION		PROJECT INFORMATION		BILLING INFORMATION	
COMPANY: Tetra Tech		PROJECT NAME: NWIRP Bethpage		BILL TO: SEE CONTRACT PO#	
ADDRESS: 5700 Lake Wright Dr., Suite 102		PROJECT #: 112G08005-WE13 LOCATION: VPB-180		ADDRESS:	
CITY: Norfolk STATE: VA ZIP: 23502		PROJECT MANAGER: Dave Brayack		CITY: STATE: ZIP:	
ATTENTION: Dave Brayack		E-MAIL: david.brayack@tetratech.com		ATTENTION: PHONE:	
PHONE: 757-466-4909 FAX: 757-461-4148		PHONE: 757-466-4909 FAX: 757-461-4148			

DATA TURNAROUND INFORMATION		DATA DELIVERABLE INFORMATION		ANALYSIS									COMMENTS																					
FAX: _____ 2 _____ DAYS* HARD COPY: _____ 2 _____ DAYS* EDD _____ 2 _____ DAYS* * TO BE APPROVED BY CHEMTECH STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS		<input type="checkbox"/> RESULTS ONLY <input type="checkbox"/> USEPA CLP <input type="checkbox"/> RESULTS + QC <input type="checkbox"/> New York State ASP "B" <input type="checkbox"/> New Jersey REDUCED <input type="checkbox"/> New York State ASP "A" <input type="checkbox"/> New Jersey CLP <input type="checkbox"/> Other _____ <input type="checkbox"/> EDD Format _____		<table border="1"> <tr> <td>VOC(SW846-8260B)</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td> </tr> </table>										VOC(SW846-8260B)												1	2	3	4	5	6	7	8	9
VOC(SW846-8260B)																																		
	1	2	3	4	5	6	7	8	9																									
				PRESERVATIVES																														

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# of Bottles	PRESERVATIVES									COMMENTS	
			COMP	GRAB	DATE	TIME		A										
1.	BP-VPB180-TB-20200505	AQ		X	5/5/20	8:00	2	2										
2.	BP-VPB180-GW-918-920	AQ		X	5/5/20	14:30	3	3										Very turbid
3.																		
4.																		
5.																		
6.																		
7.																		
8.																		
9.																		
10.																		

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE PROSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER <i>[Signature]</i>	DATE/TIME 5/6/20 1630	RECEIVED BY 1. _____	Conditions of bottles or coolers at receipt: <input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Cooler Temp <u>2.8</u> MeOH extraction requires an additional 4oz. Jar for percent solid <input checked="" type="checkbox"/> Ice in Cooler?: <u>yes</u> Comments: 48hr TAT - For VOC's see worksheet #15 of SAP 2018 for VPB program VOC list
RELINQUISHED BY 2. _____	DATE/TIME 10:05 5-7-20	RECEIVED BY 2. <i>[Signature]</i>	
RELINQUISHED BY 3. _____	DATE/TIME	RECEIVED FOR LAB BY 3. _____	

Page 1 of 1 SHIPPED VIA: CLIENT: Hand Delivered Overnight
 CHEMTECH: Picked Up Overnight **Shipment Complete**
 YES NO

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

JK-Gun #1

V@Áæ^Á c} d} æ^ Á-ó|æ\

Appendix C

Support Documents

C. Calculations for Stage 4 Data Validation

V@Áæ^Ác}á}á^Á-á|á\Á

SDG L2546

Verification calculations follow the written formula with the verification results compared to the reported value, verification value vs. reported value.

VOC (8260) SAMPLE QUANTITATION

benzene for LCS

$$\text{Cpd. Concentration} = \frac{(\text{Area}_c)(\text{Conc}_{istd})(Vf)(DL)}{(\text{Area}_{st})(RRF_c)(Vi)}$$

Calc. Concentration = 20.1

AREA c	AREA st	CONC istd	RRF	Vf	Vi	DL
258118	529114	50	1.211	5000	5000	1

Reported Concentration = 20.1

V@Áæ^Ác}á}á^Á-á|á\Á

5. VPB180 Groundwater Analytical Data Validation Table

V@Áæ^Ác}á}á^Á-á|á\Á

LOCATION	NYSDEC Groundwater Guidance or Standard Value (1)	VPB180 BP-VPB180-GW-58-60 20200406 58 60	VPB180 BP-VPB180-GW-148-150 20200407 148 150	VPB180 BP-VPB180-GW-203-205 20200407 203 205	VPB180 BP-VPB180-GW-218-220 20200408 218 220	VPB180 BP-VPB180-GW-238-240 20200408 238 240	VPB180 BP-VPB180-GW-258-260 20200408 258 260	VPB180 BP-VPB180-GW-278-280 20200409 278 280
VOLATILES (UG/L)								
1,1,1-TRICHLOROETHANE	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-TETRACHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHANE	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-DICHLOROPROPANE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-BUTANONE	50	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-HEXANONE	50	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
4-METHYL-2-PENTANONE	NC	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
ACETONE	5	25 U	25 U	25 U	25 U	25 U	25 U	3.7 J
BENZENE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMODICHLOROMETHANE	50	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	50	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOMETHANE	5	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
CARBON DISULFIDE	60	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.3 J
CARBON TETRACHLORIDE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLORODIBROMOMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROFORM	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE	0.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	5	--	--	--	--	--	--	--
ETHYLBENZENE	5	0.5 U	0.32 J	0.5 U	0.5 U	0.5 U	0.5 U	0.32 J
ISOPROPYLBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
M+P-XYLENES	NC	0.56 J	0.97 J	1 U	0.52 J	1 U	1 U	0.61 J
METHYL CYCLOHEXANE	NC	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
METHYL TERT-BUTYL ETHER	10	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYLENE CHLORIDE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
O-XYLENE	NC	0.33 J	0.47 J	0.5 U	0.31 J	0.5 U	0.5 U	0.4 J
STYRENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
TOLUENE	5	0.78 J	1.5 J	0.5 U	0.85 J	0.5 U	0.5 U	1.1 J
TRANS-1,2-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	0.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	2.2 J	2.1 J	0.5 U	0.5 U
TRICHLOROFUOROMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VINYL CHLORIDE	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

LOCATION	NYSDEC Groundwater Guidance or Standard Value (1)	VPB180 BP-VPB180-GW-303-305 20200409 303 305	VPB180 BP-VPB180-GW-303-305-D 20200409 303 305	VPB180 BP-VPB180-GW-318-320 20200410 318 320	VPB180 BP-VPB180-GW-338-340 20200410 338 340	VPB180 BP-VPB180-GW-363-365 20200414 363 365	VPB180 BP-VPB180-GW-403-405 20200415 403 405	VPB180 BP-VPB180-GW-418-420 20200415 418 420
VOLATILES (UG/L)								
1,1,1-TRICHLOROETHANE	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-TETRACHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHANE	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-DICHLOROPROPANE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-BUTANONE	50	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-HEXANONE	50	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
4-METHYL-2-PENTANONE	NC	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
ACETONE	5	2.8 J	2 J	4 J	5.3 J	3.7 J	3.3 J	2.5 U
BENZENE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMODICHLOROMETHANE	50	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	50	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOMETHANE	5	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
CARBON DISULFIDE	60	0.5 UJ	0.5 UJ	0.37 J	0.64 J	0.5 U	0.5 U	0.5 U
CARBON TETRACHLORIDE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLORODIBROMOMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROFORM	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROMETHANE	5	0.5 U	0.5 U	0.5 U	0.41 J	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE	0.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	5	--	--	--	--	--	--	--
ETHYLBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ISOPROPYLBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
M+P-XYLENES	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METHYL CYCLOHEXANE	NC	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYL TERT-BUTYL ETHER	10	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYLENE CHLORIDE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
O-XYLENE	NC	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
STYRENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TOLUENE	5	0.5 U	0.5 U	0.22 J	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	0.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROFUOROMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VINYL CHLORIDE	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

LOCATION	NYSDEC Groundwater Guidance or Standard Value (1)	VPB180 BP-VPB180-GW-438-440 20200415	VPB180 BP-VPB180-GW-458-460 20200416	VPB180 BP-VPB180-GW-483-485 20200416	VPB180 BP-VPB180-GW-483-485-D 20200416	VPB180 BP-VPB180-GW-498-500 20200417	VPB180 BP-VPB180-GW-538-540 20200421	VPB180 BP-VPB180-GW-558-560 20200421
SAMPLE ID								
SAMPLE DATE								
TOP DEPTH		438	458	483	483	498	538	558
BOTTOM DEPTH		440	460	485	485	500	540	560
VOLATILES (UG/L)								
1,1,1-TRICHLOROETHANE	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-TETRACHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHANE	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-DICHLOROPROPANE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-BUTANONE	50	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-HEXANONE	50	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
4-METHYL-2-PENTANONE	NC	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
ACETONE	5	2.5 U	3.8 J	2.7 J	3.9 J	25 U	25 U	25 U
BENZENE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMODICHLOROMETHANE	50	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	50	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOMETHANE	5	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
CARBON DISULFIDE	60	0.5 U	0.5 U	0.87 J	0.5 U	0.5 U	0.5 U	0.5 U
CARBON TETRACHLORIDE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLORODIBROMOMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROFORM	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE	0.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	5	--	--	--	--	--	--	--
ETHYLBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ISOPROPYLBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
M+P-XYLENES	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METHYL CYCLOHEXANE	NC	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYL TERT-BUTYL ETHER	10	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYLENE CHLORIDE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
O-XYLENE	NC	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
STYRENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TOLUENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	0.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2.2 J
TRICHLOROFUOROMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VINYL CHLORIDE	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

LOCATION	NYSDEC Groundwater Guidance or Standard Value (1)	VPB180 BP-VPB180-GW-588-590 20200422	VPB180 BP-VPB180-GW-618-620 20200423	VPB180 BP-VPB180-GW-618-620-D 20200423	VPB180 BP-VPB180-GW-638-640 20200424	VPB180 BP-VPB180-GW-738-740 20200428	VPB180 BP-VPB180-GW-768-770 20200429	VPB180 BP-VPB180-GW-768-770-D 20200429
SAMPLE ID								
SAMPLE DATE								
TOP DEPTH		588	518	618	638	738	768	768
BOTTOM DEPTH		590	620	620	640	740	770	770
VOLATILES (UG/L)								
1,1,1-TRICHLOROETHANE	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-TETRACHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	1	2.2 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	5	6.1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHENE	5	2.8 J	0.5 U	0.5 U	0.5 U	0.5 U	1.1 J	0.98 J
1,2-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHANE	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-DICHLOROPROPANE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-BUTANONE	50	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-HEXANONE	50	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
4-METHYL-2-PENTANONE	NC	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
ACETONE	5	4.6 J	4.3 J	3.2 J	13 J	11.4 J	4.4 J	5.6 J
BENZENE	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMODICHLOROMETHANE	50	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	50	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOMETHANE	5	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
CARBON DISULFIDE	60	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CARBON TETRACHLORIDE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLORODIBROMOMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROFORM	7	2.7 J	0.5 U	0.5 U	0.5 U	0.5 U	0.47 J	0.44 J
CHLOROMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	5	3 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE	0.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	5	0.5 U	0.5 U	0.5 U	--	--	--	--
ETHYLBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ISOPROPYLBENZENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
M+P-XYLENES	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METHYL CYCLOHEXANE	NC	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYL TERT-BUTYL ETHER	10	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYLENE CHLORIDE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
O-XYLENE	NC	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
STYRENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TOLUENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	0.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	5	400	1.3 J	0.5 U	0.5 U	14.8	46.3	46.6
TRICHLOROFUOROMETHANE	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VINYL CHLORIDE	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

LOCATION	NYSDEC Groundwater Guidance or Standard Value (1)	VPB180 BP-VPB180-GW-803-805 20200430 803 805	VPB180 BP-VPB180-GW-858-860 20200504 858 860	VPB180 BP-VPB180-GW-878-880 20200504 878 880
VOLATILES (UG/L)				
1,1,1-TRICHLOROETHANE	5	0.75 U	0.75 U	0.75 U
1,1,2,2-TETRACHLOROETHANE	5	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	1	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	5	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	5	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHANE	5	0.75 U	0.75 U	0.75 U
1,2-DICHLOROPROPANE	1	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U
1,4-DICHLOROBENZENE	3	0.5 U	0.5 U	0.5 U
2-BUTANONE	50	2.5 U	2.5 U	2.5 U
2-HEXANONE	50	3.8 U	3.8 U	3.8 U
4-METHYL-2-PENTANONE	NC	2.5 U	2.5 U	2.5 U
ACETONE	5	5.7 J	25 U	25 U
BENZENE	1	0.5 U	0.5 U	0.5 U
BROMODICHLOROMETHANE	50	0.5 U	0.5 U	0.5 U
BROMOFORM	50	0.5 U	0.5 U	0.5 U
BROMOMETHANE	5	3.8 UJ	3.8 U	3.8 U
CARBON DISULFIDE	60	0.5 U	0.5 U	0.5 U
CARBON TETRACHLORIDE	5	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	5	0.5 U	0.5 U	0.5 U
CHLORODIBROMOMETHANE	5	0.5 U	0.5 U	0.5 U
CHLOROETHANE	5	0.5 U	0.5 U	0.5 U
CHLOROFORM	7	0.5 U	0.5 U	0.5 U
CHLOROMETHANE	5	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE	0.4	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	5	--	--	--
ETHYLBENZENE	5	0.5 U	0.5 U	0.5 U
ISOPROPYLBENZENE	5	0.5 U	0.5 U	0.5 U
M+P-XYLENES	NC	1 U	1 U	1 U
METHYL CYCLOHEXANE	NC	0.5 U	0.5 U	0.5 U
METHYL TERT-BUTYL ETHER	10	0.5 U	0.5 U	0.5 U
METHYLENE CHLORIDE	5	0.5 U	0.5 U	0.5 U
O-XYLENE	NC	0.5 U	0.5 U	0.5 U
STYRENE	5	0.5 U	0.5 U	0.5 U
TETRACHLOROETHENE	5	0.5 U	0.5 U	0.5 U
TOLUENE	5	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	5	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	0.4	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	5	0.5 U	0.5 U	0.5 U
TRICHLOROFUOROMETHANE	5	0.5 U	0.5 U	0.5 U
VINYL CHLORIDE	2	0.5 U	0.5 U	0.5 U

Notes:
 1 - New York State Department of Environmental Conservation Division of Water. Technical and Operation Guidance series (6 NYCRR 700-706, Part 703.5 summarized in TOGS 1.1.1). Ambient water quality standards and groundwater effluent limitations, class GA.
 ft bgs = feet below ground surface
 NC = No criteria
 UG/L = micrograms per Liter
 UG/KG = micrograms per kilogram
Bold = Exceeds NYS Groundwater Standards or guidance value.
 U = Undetected. The parameter was analyzed but undetected at the listed limit of quantitation or was qualified as undetected during data review due to blank artifacts.
 J = Estimated value. One or more quality control parameters were outside control limits or the analyte concentration was less than the limit of quantitation.
 UJ = Undetected and estimated. The analyte was analyzed but undetected at the listed limit of quantitation; one or more quality control parameters were outside control limits.

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6. VPB180 Air Sample Analytical Data Validation

Validation Letter

Chain of Custody Records

Analytical Data Sheets

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VALIDATA

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(770) 232-5082 (Fax)

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DATA VALIDATION SUMMARY REPORT - CHEMISTRY

COMPANY: Tetra Tech, Inc., Norfolk, VA
PROJECT NAME: Basewide Groundwater Investigation, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, N62470-16-D-9008
SITE NAME: CTO-WE13
CONTRACTED LAB: Eurofins Air Toxics, Inc.
JOB NO./ACCOUNTING CODE: 112G08005-WE13
QA/QC LEVEL: EPA Stage 4
ANALYTICAL METHOD(S): US EPA Method TO-15
VALIDATION GUIDELINES: Draft Tier II Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Vertical Profile Boring and Monitoring Well Instillation Program, March 2019, DOD QSM 5.0; July 2013, DOD Data Validation Guidance, February 2018, Method criteria, Laboratory limits and Professional Judgment
SAMPLE MATRIX: Air
TYPES OF ANALYSES: Volatile Organic Compounds (VOC)
DATA VALIDATION DATE: June 19, 2020
DATA REVIEWER(S): Amy L. Hogan
SDG NUMBER: 2004368
SAMPLING DATE(S): April 16, 2020

SAMPLES:

<u>Client Sample ID</u>	<u>Laboratory ID</u>	<u>VOC</u>
BP-VPB180-AIR-UW-20200416	2004368-01	X
BP-VPB180-AIR-UW-20200416MD	2004368-01MD	X
BP-VPB180-AIR-DW-20200416	2004368-02	X

Suffix Codes: DL= DILUTION, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE
MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA VALIDATION SUMMARY

Air Toxics, Inc – SDG: 2004368 – Organic Chemistry

VOLATILE ORGANICS

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per EPA Method TO-15.

II.) Overall Assessment of Data:

All laboratory data were acceptable with qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

The Percent Difference (%D) for the standards run on 4/30/20 at 08:43 on instrument MSDV was 32% for hexachlorobutadiene, which exceeded the 30% QC limit. The results for this compound in the SDG samples, which were both non-detects, were qualified as estimated (UJ) with reason code C.

The Percent Difference (%D) for the standards run on 4/30/20 at 23:33 on instrument MSDV was 32% for hexachlorobutadiene, which exceeded the 30% QC limit. The results for this compound in the SDG samples, which were both non-detects, were qualified as estimated (UJ) with reason code C.

IV.) Blanks:

Method Blanks:

Acetone (0.49 ug/m³) was detected in method blank 2004368-03A. Since the blank result was less than the LOQ and all sample results for acetone were greater than the LOQ, no data qualification was necessary.

There were detections in associated method blank 2004368-03B for the following compounds:

1,2-dibromoethane	0.055 ug/m ³
1,2-dichloroethane	0.015 ug/m ³
1,4-dichlorobenzene	0.069 ug/m ³

Since the blank result for 1,2-dichloroethane was less than the LOQ, the results for this compound in the samples, which were less than the LOQ, were qualified as undetected (U) with the result being raised to the LOQ and reason code A. Since there no positive results for the other listed compounds, no further data qualification was necessary.

Equipment and Rinsate Blanks:

There was no equipment or rinsate blank associated with this SDG. No data qualification was necessary.

Field Blank:

There was no associated field blank for this SDG. No data qualification was necessary.

Trip Blank:

There was no associated trip blank for this SDG. No data qualification was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS / LCSD set was analyzed by the laboratory for this SDG. All criteria were met. No data qualification was necessary.

VII.) Matrix Duplicate (MD):

MD analysis was performed using SDG sample BP-VPB180-AIR-UW-20200416. All criteria were met. No data qualification was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples identified as part of this SDG. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All CRQL criteria were met. No data qualification was necessary.

XII.) Sample Calculation Verification (Stage 4):

No discrepancies were noted in the sample calculation verification process.

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Appendix A

Data Qualification Summary Table (DQST) with Qualification Codes

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DATA QUALIFICATION SUMMARY TABLE (DQST) WITH QUALIFICATION CODES

VOC								
Client Sample ID	Date Collected	Lab Sample ID	Analyte	Lab Qual	Val Result	VAL_RES ERROR	Val Qual	Val Reason
BP-VPB180-AIR-DW-2020041	4/16/2020 0:00	2004368-02A	HEXACHLOROBUTADIENE	U	7		UJ	C
BP-VPB180-AIR-DW-2020041	4/16/2020 0:00	2004368-02B	1,2-DICHLOROETHANE	J	0.082	0.13	U	A
BP-VPB180-AIR-UW-2020041	4/16/2020 0:00	2004368-01A	HEXACHLOROBUTADIENE	U	7.2		UJ	C
BP-VPB180-AIR-UW-2020041	4/16/2020 0:00	2004368-01B	1,2-DICHLOROETHANE	J	0.082	0.14	U	A

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Appendix B

Laboratory Sample Results

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	BP-VPB180-AIR-UW-20200416	Date/Time Analyzed:	4/30/20 10:04 PM
Lab ID:	2004368-01A	Dilution Factor:	1.68
Date/Time Collected:	4/16/20 03:37 PM	Instrument/Filename:	msdv.i / v043021
Media:	6 Liter Summa Canister (100% SIM Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trichlorobenzene	120-82-1	2.3	5.0	6.2	5.0 U
1,2,4-Trimethylbenzene	95-63-6	0.18	0.66	0.82	0.66 U
1,2-Dichlorobenzene	95-50-1	0.18	0.81	1.0	0.81 U
1,2-Dichloropropane	78-87-5	0.19	0.62	0.78	0.62 U
1,3,5-Trimethylbenzene	108-67-8	0.16	0.66	0.82	0.66 U
1,3-Butadiene	106-99-0	0.080	0.30	0.37	0.30 U
1,3-Dichlorobenzene	541-73-1	0.35	0.81	1.0	0.81 U
1,4-Dioxane	123-91-1	0.32	0.48	0.60	0.48 U
2,2,4-Trimethylpentane	540-84-1	0.68	3.1	3.9	3.1 U
2-Butanone (Methyl Ethyl Ketone)	78-93-3	0.51	2.0	2.5	2.0 U
2-Hexanone	591-78-6	0.87	2.8	3.4	2.8 U
2-Propanol	67-63-0	0.23	1.6	2.1	1.6 U
3-Chloropropene	107-05-1	0.96	2.1	2.6	2.1 U
4-Ethyltoluene	622-96-8	0.19	0.66	0.82	0.66 U
4-Methyl-2-pentanone	108-10-1	0.17	0.55	0.69	0.55 U
Acetone	67-64-1	0.67	1.6	4.0	5.2
alpha-Chlorotoluene	100-44-7	0.17	0.70	0.87	0.70 U
Bromodichloromethane	75-27-4	0.41	0.90	1.1	0.90 U
Bromoform	75-25-2	0.41	1.4	1.7	1.4 U
Bromomethane	74-83-9	0.57	2.6	3.3	2.6 U
Carbon Disulfide	75-15-0	0.45	2.1	2.6	2.1 U
Chlorobenzene	108-90-7	0.20	0.62	0.77	0.62 U
cis-1,3-Dichloropropene	10061-01-5	0.15	0.61	0.76	0.61 U
Cumene	98-82-8	0.13	0.66	0.82	0.66 U

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	BP-VPB180-AIR-UW-20200416	Date/Time Analyzed:	4/30/20 10:04 PM
Lab ID:	2004368-01A	Dilution Factor:	1.68
Date/Time Collected:	4/16/20 03:37 PM	Instrument/Filename:	msdv.i / v043021
Media:	6 Liter Summa Canister (100% SIM Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Cyclohexane	110-82-7	0.16	0.46	2.9	0.46 U
Dibromochloromethane	124-48-1	0.43	1.1	1.4	1.1 U
Ethanol	64-17-5	0.33	1.3	3.2	2.5 J
Freon 11	75-69-4	0.19	0.76	0.94	1.3
Freon 113	76-13-1	0.25	1.0	1.3	0.53 J
Heptane	142-82-5	0.23	2.8	3.4	2.8 U
Hexachlorobutadiene	87-68-3	3.0	7.2	9.0	7.2 U
Hexane	110-54-3	0.33	2.4	3.0	2.4 U
Methylene Chloride	75-09-2	0.17	0.47	1.2	0.38 J
Propylbenzene	103-65-1	0.21	0.66	0.82	0.66 U
Styrene	100-42-5	0.077	0.57	0.72	0.57 U
Tetrahydrofuran	109-99-9	0.98	2.0	2.5	2.0 U
trans-1,3-Dichloropropene	10061-02-6	0.18	0.61	0.76	0.61 U

U = The analyte was not detected above the MDL.

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	80-142	100
4-Bromofluorobenzene	460-00-4	72-122	92
Toluene-d8	2037-26-5	84-116	98

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	BP-VPB180-AIR-UW-20200416	Date/Time Analyzed:	4/30/20 10:04 PM
Lab ID:	2004368-01B	Dilution Factor:	1.68
Date/Time Collected:	4/16/20 03:37 PM	Instrument/Filename:	msdv.i / v043021sim
Media:	6 Liter Summa Canister (100% SIM Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	71-55-6	0.055	0.16	0.18	0.16 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	0.21	0.23	0.21 U
1,1,2-Trichloroethane	79-00-5	0.056	0.16	0.18	0.16 U
1,1-Dichloroethane	75-34-3	0.045	0.12	0.14	0.12 U
1,1-Dichloroethene	75-35-4	0.053	0.060	0.067	0.060 U
1,2-Dibromoethane (EDB)	106-93-4	0.040	0.23	0.64	0.23 U
1,2-Dichloroethane	107-06-2	0.025	0.12	0.14	0.082 J
1,4-Dichlorobenzene	106-46-7	0.11	0.18	0.50	0.18 U
Benzene	71-43-2	0.16	0.16	0.27	0.45
Carbon Tetrachloride	56-23-5	0.098	0.19	0.21	0.38 U
Chloroethane	75-00-3	0.033	0.13	0.22	0.13 U
Chloroform	67-66-3	0.047	0.15	0.16	0.078 J
Chloromethane	74-87-3	0.042	0.10	1.7	1.0 J
cis-1,2-Dichloroethene	156-59-2	0.047	0.12	0.13	0.12 U
Ethyl Benzene	100-41-4	0.096	0.13	0.14	0.13 U
Freon 114	76-14-2	0.069	0.21	0.23	0.11 J
Freon 12	75-71-8	0.043	0.15	0.42	2.2
m,p-Xylene	108-38-3	0.17	0.22	0.29	0.26 J
Methyl tert-butyl ether	1634-04-4	0.053	0.18	0.60	0.18 U
o-Xylene	95-47-6	0.033	0.13	0.14	0.10 J
Tetrachloroethene	127-18-4	0.043	0.20	0.23	0.20 U
Toluene	108-88-3	0.096	0.19	0.32	0.53
trans-1,2-Dichloroethene	156-60-5	0.051	0.20	0.67	0.20 U
Trichloroethene	79-01-6	0.12	0.16	0.18	0.16 U

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	BP-VPB180-AIR-UW-20200416	Date/Time Analyzed:	4/30/20 10:04 PM
Lab ID:	2004368-01B	Dilution Factor:	1.68
Date/Time Collected:	4/16/20 03:37 PM	Instrument/Filename:	msdv.i / v043021sim
Media:	6 Liter Summa Canister (100% SIM Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	75-01-4	0.033	0.039	0.086	0.039 U

J = Estimated value.

U = The analyte was not detected above the MDL.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	82-139	95
4-Bromofluorobenzene	460-00-4	67-126	92
Toluene-d8	2037-26-5	86-119	102

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	BP-VPB180-AIR-DW-20200416	Date/Time Analyzed:	4/30/20 09:26 PM
Lab ID:	2004368-02A	Dilution Factor:	1.64
Date/Time Collected:	4/16/20 03:36 PM	Instrument/Filename:	msdv.i / v043020
Media:	6 Liter Summa Canister (100% SIM Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trichlorobenzene	120-82-1	2.2	4.9	6.1	4.9 U
1,2,4-Trimethylbenzene	95-63-6	0.18	0.64	0.81	0.64 U
1,2-Dichlorobenzene	95-50-1	0.18	0.79	0.99	0.79 U
1,2-Dichloropropane	78-87-5	0.18	0.61	0.76	0.61 U
1,3,5-Trimethylbenzene	108-67-8	0.16	0.64	0.81	0.64 U
1,3-Butadiene	106-99-0	0.078	0.29	0.36	0.29 U
1,3-Dichlorobenzene	541-73-1	0.34	0.79	0.99	0.79 U
1,4-Dioxane	123-91-1	0.31	0.47	0.59	0.47 U
2,2,4-Trimethylpentane	540-84-1	0.67	3.1	3.8	3.1 U
2-Butanone (Methyl Ethyl Ketone)	78-93-3	0.49	1.9	2.4	0.62 J
2-Hexanone	591-78-6	0.85	2.7	3.4	2.7 U
2-Propanol	67-63-0	0.23	1.6	2.0	0.69 J
3-Chloropropene	107-05-1	0.94	2.0	2.6	2.0 U
4-Ethyltoluene	622-96-8	0.19	0.64	0.81	0.64 U
4-Methyl-2-pentanone	108-10-1	0.16	0.54	0.67	0.54 U
Acetone	67-64-1	0.66	1.6	3.9	7.3
alpha-Chlorotoluene	100-44-7	0.17	0.68	0.85	0.68 U
Bromodichloromethane	75-27-4	0.40	0.88	1.1	0.88 U
Bromoform	75-25-2	0.40	1.4	1.7	1.4 U
Bromomethane	74-83-9	0.56	2.5	3.2	2.5 U
Carbon Disulfide	75-15-0	0.44	2.0	2.6	2.0 U
Chlorobenzene	108-90-7	0.20	0.60	0.76	0.60 U
cis-1,3-Dichloropropene	10061-01-5	0.15	0.60	0.74	0.60 U
Cumene	98-82-8	0.12	0.64	0.81	0.64 U

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	BP-VPB180-AIR-DW-20200416	Date/Time Analyzed:	4/30/20 09:26 PM
Lab ID:	2004368-02A	Dilution Factor:	1.64
Date/Time Collected:	4/16/20 03:36 PM	Instrument/Filename:	msdv.i / v043020
Media:	6 Liter Summa Canister (100% SIM Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Cyclohexane	110-82-7	0.15	0.45	2.8	0.45 U
Dibromochloromethane	124-48-1	0.42	1.1	1.4	1.1 U
Ethanol	64-17-5	0.32	1.2	3.1	4.0
Freon 11	75-69-4	0.19	0.74	0.92	1.2
Freon 113	76-13-1	0.25	1.0	1.2	0.56 J
Heptane	142-82-5	0.23	2.7	3.4	2.7 U
Hexachlorobutadiene	87-68-3	3.0	7.0	8.7	7.0 U
Hexane	110-54-3	0.32	2.3	2.9	2.3 U
Methylene Chloride	75-09-2	0.16	0.46	1.1	0.59 J
Propylbenzene	103-65-1	0.20	0.64	0.81	0.64 U
Styrene	100-42-5	0.075	0.56	0.70	0.56 U
Tetrahydrofuran	109-99-9	0.96	1.9	2.4	1.9 U
trans-1,3-Dichloropropene	10061-02-6	0.18	0.60	0.74	0.60 U

U = The analyte was not detected above the MDL.

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	80-142	100
4-Bromofluorobenzene	460-00-4	72-122	92
Toluene-d8	2037-26-5	84-116	100

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	BP-VPB180-AIR-DW-20200416	Date/Time Analyzed:	4/30/20 09:26 PM
Lab ID:	2004368-02B	Dilution Factor:	1.64
Date/Time Collected:	4/16/20 03:36 PM	Instrument/Filename:	msdv.i / v043020sim
Media:	6 Liter Summa Canister (100% SIM Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	71-55-6	0.054	0.16	0.18	0.16 U
1,1,2,2-Tetrachloroethane	79-34-5	0.074	0.20	0.22	0.20 U
1,1,2-Trichloroethane	79-00-5	0.054	0.16	0.18	0.16 U
1,1-Dichloroethane	75-34-3	0.044	0.12	0.13	0.12 U
1,1-Dichloroethene	75-35-4	0.052	0.058	0.065	0.058 U
1,2-Dibromoethane (EDB)	106-93-4	0.040	0.23	0.63	0.23 U
1,2-Dichloroethane	107-06-2	0.024	0.12	0.13	0.082 J
1,4-Dichlorobenzene	106-46-7	0.11	0.18	0.49	0.18 U
Benzene	71-43-2	0.15	0.16	0.26	0.42
Carbon Tetrachloride	56-23-5	0.096	0.18	0.21	0.42
Chloroethane	75-00-3	0.032	0.13	0.22	0.13 U
Chloroform	67-66-3	0.046	0.14	0.16	0.079 J
Chloromethane	74-87-3	0.040	0.10	1.7	1.0 J
cis-1,2-Dichloroethene	156-59-2	0.046	0.12	0.13	0.12 U
Ethyl Benzene	100-41-4	0.094	0.13	0.14	0.13 U
Freon 114	76-14-2	0.068	0.21	0.23	0.11 J
Freon 12	75-71-8	0.042	0.14	0.40	2.2
m,p-Xylene	108-38-3	0.17	0.21	0.28	0.21 U
Methyl tert-butyl ether	1634-04-4	0.051	0.18	0.59	0.18 U
o-Xylene	95-47-6	0.032	0.13	0.14	0.060 J
Tetrachloroethene	127-18-4	0.042	0.20	0.22	0.047 J
Toluene	108-88-3	0.094	0.18	0.31	0.31 J
trans-1,2-Dichloroethene	156-60-5	0.050	0.20	0.65	0.20 U
Trichloroethene	79-01-6	0.12	0.16	0.18	0.16 U

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	BP-VPB180-AIR-DW-20200416	Date/Time Analyzed:	4/30/20 09:26 PM
Lab ID:	2004368-02B	Dilution Factor:	1.64
Date/Time Collected:	4/16/20 03:36 PM	Instrument/Filename:	msdv.i / v043020sim
Media:	6 Liter Summa Canister (100% SIM Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	75-01-4	0.032	0.038	0.084	0.038 U

J = Estimated value.

U = The analyte was not detected above the MDL.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	82-139	94
4-Bromofluorobenzene	460-00-4	67-126	92
Toluene-d8	2037-26-5	86-119	102

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Appendix C

Support Documents

A. Documents Supporting Qualifications

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CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdv.i Injection Date: 30-APR-2020 08:43
 Lab File ID: v043002a.d Init. Cal. Date(s): 08-APR-2020 22-APR-2020
 Analysis Type: AIR Init. Cal. Times: 13:35 13:27
 Lab Sample ID: CCV Quant Type: ISTD
 Method: /chem/msdv.i/30APR20.b/v2010408b.m

COMPOUND	RRF / AMOUNT		MIN		MAX		CURVE TYPE
	RRF	AMOUNT	RF10	RRF	%D / %DRIFT	%D / %DRIFT	
9 Propylene	0.99523		0.93950	0.010	5.59946	40.00000	Averaged
11 Freon 12	4.00027		3.91139	0.010	2.22188	30.00000	Averaged
15 Freon 114	2.61942		2.62944	0.010	-0.38248	30.00000	Averaged
17 Chloromethane	1.20887		1.16129	0.010	3.93593	30.00000	Averaged
23 Butane	0.26756		0.24263	0.010	9.31601	40.00000	Averaged
25 Vinyl Chloride	1.23878		1.37238	0.010	-10.78488	30.00000	Averaged
26 1,3-Butadiene	0.95319		0.96958	0.010	-1.71929	30.00000	Averaged
29 Bromomethane	0.87477		1.08268	0.010	-23.76740	30.00000	Averaged
30 Chloroethane	0.60374		0.63891	0.010	-5.82626	30.00000	Averaged
31 Isopentane	1.08412		1.05748	0.010	2.45688	40.00000	Averaged
35 Freon 11	3.72216		3.88079	0.010	-4.26179	30.00000	Averaged
42 Ethanol	0.48551		0.38794	0.010	20.09614	30.00000	Averaged
49 Freon 113	3.45139		3.41843	0.010	0.95480	30.00000	Averaged
50 1,1-Dichloroethene	1.41539		1.31231	0.010	7.28305	30.00000	Averaged
52 Acetone	0.66504		0.67453	0.010	-1.42804	30.00000	Averaged
56 Carbon Disulfide	3.96862		4.21622	0.010	-6.23905	30.00000	Averaged
57 2-Propanol	2.33277		1.90949	0.010	18.14486	30.00000	Averaged
58 3-Chloropropene	0.56518		0.53862	0.010	4.69871	30.00000	Averaged
66 Methylene Chloride	1.38717		1.39214	0.010	-0.35863	30.00000	Averaged
71 tert-Butyl alcohol	2.69681		2.38447	0.010	11.58194	40.00000	Averaged
72 Methyl tert-butyl ether	4.22744		3.72894	0.010	11.79192	30.00000	Averaged
73 trans-1,2-Dichloroethene	0.91623		0.87011	0.010	5.03329	30.00000	Averaged
78 Hexane	2.35048		2.14006	0.010	8.95226	30.00000	Averaged
83 Isopropyl ether	4.92805		4.50490	0.010	8.58663	40.00000	Averaged
82 1,1-Dichloroethane	2.88360		2.86379	0.010	0.68709	30.00000	Averaged
86 Vinyl Acetate	0.38383		0.36293	0.010	5.44537	40.00000	Averaged
88 Ethyl-tert-butyl ether	4.90486		4.32457	0.010	11.83075	40.00000	Averaged
91 cis-1,2-Dichloroethene	1.12318		1.07708	0.010	4.10396	30.00000	Averaged
92 2-Butanone	0.75492		0.74589	0.010	1.19659	30.00000	Averaged
99 Tetrahydrofuran	1.74517		1.80757	0.010	-3.57527	30.00000	Averaged
100 Chloroform	3.41028		3.37521	0.010	1.02827	30.00000	Averaged
102 Cyclohexane	2.18924		2.02645	0.010	7.43605	30.00000	Averaged
103 1,1,1-Trichloroethane	3.46598		3.33711	0.010	3.71820	30.00000	Averaged
106 Carbon Tetrachloride	2.93486		2.00854	0.010	31.56258	30.00000	Averaged
113 2,2,4-Trimethylpentane	2.41473		2.18297	0.010	9.59789	30.00000	Averaged
116 Benzene	1.26944		1.44892	0.010	-14.13840	30.00000	Averaged

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CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdv.i Injection Date: 30-APR-2020 08:43
 Lab File ID: v043002a.d Init. Cal. Date(s): 08-APR-2020 22-APR-2020
 Analysis Type: AIR Init. Cal. Times: 13:35 13:27
 Lab Sample ID: CCV Quant Type: ISTD
 Method: /chem/msdv.i/30APR20.b/v2010408b.m

COMPOUND	RRF / AMOUNT	RF10	MIN		MAX		CURVE TYPE
			RRF	%D / %DRIFT	%D / %DRIFT		
\$ 117 1,2-Dichloroethane-d4	1.56952	1.43321	0.010	8.68446	30.00000	Averaged	
119 tert-Amyl methyl ether	0.26402	0.28761	0.010	-8.93428	40.00000	Averaged	
120 1,2-Dichloroethane	0.59261	0.65183	0.010	-9.99246	30.00000	Averaged	
121 Heptane	0.34448	0.39801	0.010	-15.53761	30.00000	Averaged	
125 Trichloroethene	0.52762	0.65514	0.010	-24.16891	30.00000	Averaged	
127 Methylcyclohexane	0.72560	0.76210	0.010	-5.03119	40.00000	Averaged	
132 1,2-Dichloropropane	0.46511	0.52123	0.010	-12.06627	30.00000	Averaged	
136 1,4-Dioxane	0.31473	0.31463	0.010	0.03013	30.00000	Averaged	
138 Bromodichloromethane	1.07479	1.18048	0.010	-9.83420	30.00000	Averaged	
144 cis-1,3-Dichloropropene	0.73638	0.72831	0.010	1.09471	30.00000	Averaged	
145 4-Methyl-2-pentanone	0.90816	0.93502	0.010	-2.95679	30.00000	Averaged	
\$ 146 Toluene-d8	1.00406	1.02513	0.010	-2.09908	30.00000	Averaged	
147 Toluene	1.44895	1.55434	0.010	-7.27376	30.00000	Averaged	
150 trans-1,3-Dichloropropene	0.80428	0.80453	0.010	-0.03087	30.00000	Averaged	
155 1,1,2-Trichloroethane	0.58499	0.67077	0.010	-14.66360	30.00000	Averaged	
156 Tetrachloroethene	0.76394	0.83803	0.010	-9.69899	30.00000	Averaged	
158 2-Hexanone	0.51204	0.51235	0.010	-0.06002	30.00000	Averaged	
160 Dibromochloromethane	1.02102	1.12772	0.010	-10.44971	30.00000	Averaged	
161 1,2-Dibromoethane (EDB)	0.95370	1.02903	0.010	-7.89882	30.00000	Averaged	
165 Chlorobenzene	1.24984	1.31444	0.010	-5.16873	30.00000	Averaged	
167 Ethyl Benzene	0.65511	0.62723	0.010	4.25536	30.00000	Averaged	
169 m,p-Xylene	0.72596	0.71864	0.010	1.00912	30.00000	Averaged	
171 o-Xylene	0.68674	0.66095	0.010	3.75671	30.00000	Averaged	
172 Styrene	1.08973	1.06022	0.010	2.70862	30.00000	Averaged	
174 Bromoform	0.90631	0.94947	0.010	-4.76175	30.00000	Averaged	
175 Cumene	2.11604	2.03174	0.010	3.98431	30.00000	Averaged	
\$ 177 4-Bromofluorobenzene	0.53243	0.49837	0.010	6.39705	30.00000	Averaged	
181 1,1,2,2-Tetrachloroethane	1.04437	1.00427	0.010	3.84014	30.00000	Averaged	
182 Propylbenzene	2.43610	2.47089	0.010	-1.42805	30.00000	Averaged	
188 4-Ethyltoluene	1.98896	2.05789	0.010	-3.46566	30.00000	Averaged	
190 1,3,5-Trimethylbenzene	1.96998	2.00621	0.010	-1.83938	30.00000	Averaged	
196 1,2,4-Trimethylbenzene	1.59050	1.62290	0.010	-2.03737	30.00000	Averaged	
208 1,3-Dichlorobenzene	0.87596	0.91101	0.010	-4.00115	30.00000	Averaged	
209 1,4-Dichlorobenzene	0.84350	0.89589	0.010	-6.21154	30.00000	Averaged	
212 alpha-Chlorotoluene	0.81195	0.74097	0.010	8.74226	30.00000	Averaged	

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CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdv.i Injection Date: 30-APR-2020 08:43
Lab File ID: v043002a.d Init. Cal. Date(s): 08-APR-2020 22-APR-2020
Analysis Type: AIR Init. Cal. Times: 13:35 13:27
Lab Sample ID: CCV Quant Type: ISTD
Method: /chem/msdv.i/30APR20.b/v2010408b.m

COMPOUND	RRF / AMOUNT	RF10	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE
214 1,2-Dichlorobenzene	0.72928	0.78556	0.010	-7.71767	30.00000	Averaged
226 1,2,4-Trichlorobenzene	0.35662	0.39978	0.010	-12.10422	30.00000	Averaged
227 Hexachlorobutadiene	0.38536	0.50999	0.010	-32.33908	30.00000	Averaged
228 Naphthalene	0.35890	0.28794	0.010	19.77142	30.00000	Averaged

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CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdv.i Injection Date: 30-APR-2020 23:33
 Lab File ID: v043023a.d Init. Cal. Date(s): 08-APR-2020 22-APR-2020
 Analysis Type: AIR Init. Cal. Times: 13:35 13:27
 Lab Sample ID: CCV Quant Type: ISTD
 Method: /chem/msdv.i/30APR20.b/v2010408b.m

COMPOUND	RRF / AMOUNT		MIN		MAX		CURVE TYPE
	RRF	AMOUNT	RF10	RRF	%D / %DRIFT	%D / %DRIFT	
9 Propylene	0.99523		0.90266	0.010	9.30061	40.00000	Averaged
11 Freon 12	4.00027		3.79039	0.010	5.24670	30.00000	Averaged
15 Freon 114	2.61942		2.55200	0.010	2.57366	30.00000	Averaged
17 Chloromethane	1.20887		1.12511	0.010	6.92831	30.00000	Averaged
23 Butane	0.26756		0.22898	0.010	14.41966	40.00000	Averaged
25 Vinyl Chloride	1.23878		1.34706	0.010	-8.74156	30.00000	Averaged
26 1,3-Butadiene	0.95319		0.95257	0.010	0.06511	30.00000	Averaged
29 Bromomethane	0.87477		1.05930	0.010	-21.09483	30.00000	Averaged
30 Chloroethane	0.60374		0.63172	0.010	-4.63488	30.00000	Averaged
31 Isopentane	1.08412		0.96938	0.010	10.58321	40.00000	Averaged
35 Freon 11	3.72216		3.80998	0.010	-2.35943	30.00000	Averaged
42 Ethanol	0.48551		0.35837	0.010	26.18656	30.00000	Averaged
49 Freon 113	3.45139		3.42049	0.010	0.89517	30.00000	Averaged
50 1,1-Dichloroethene	1.41539		1.24983	0.010	11.69706	30.00000	Averaged
52 Acetone	0.66504		0.64416	0.010	3.13887	30.00000	Averaged
56 Carbon Disulfide	3.96862		4.14776	0.010	-4.51392	30.00000	Averaged
57 2-Propanol	2.33277		1.77502	0.010	23.90934	30.00000	Averaged
58 3-Chloropropene	0.56518		0.50054	0.010	11.43610	30.00000	Averaged
66 Methylene Chloride	1.38717		1.31967	0.010	4.86599	30.00000	Averaged
71 tert-Butyl alcohol	2.69681		2.26251	0.010	16.10430	40.00000	Averaged
72 Methyl tert-butyl ether	4.22744		3.59325	0.010	15.00184	30.00000	Averaged
73 trans-1,2-Dichloroethene	0.91623		0.88068	0.010	3.87942	30.00000	Averaged
78 Hexane	2.35048		2.05467	0.010	12.58514	30.00000	Averaged
83 Isopropyl ether	4.92805		4.39410	0.010	10.83490	40.00000	Averaged
82 1,1-Dichloroethane	2.88360		2.82618	0.010	1.99140	30.00000	Averaged
86 Vinyl Acetate	0.38383		0.35531	0.010	7.43015	40.00000	Averaged
88 Ethyl-tert-butyl ether	4.90486		4.19426	0.010	14.48765	40.00000	Averaged
91 cis-1,2-Dichloroethene	1.12318		1.07944	0.010	3.89463	30.00000	Averaged
92 2-Butanone	0.75492		0.73209	0.010	3.02409	30.00000	Averaged
99 Tetrahydrofuran	1.74517		1.45401	0.010	16.68390	30.00000	Averaged
100 Chloroform	3.41028		3.35197	0.010	1.70977	30.00000	Averaged
102 Cyclohexane	2.18924		1.97914	0.010	9.59706	30.00000	Averaged
103 1,1,1-Trichloroethane	3.46598		3.34138	0.010	3.59487	30.00000	Averaged
106 Carbon Tetrachloride	2.93486		1.99208	0.010	32.12336	30.00000	Averaged
113 2,2,4-Trimethylpentane	2.41473		2.11137	0.010	12.56283	30.00000	Averaged
116 Benzene	1.26944		1.49080	0.010	-17.43747	30.00000	Averaged

US32TAR1

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdv.i Injection Date: 30-APR-2020 23:33
 Lab File ID: v043023a.d Init. Cal. Date(s): 08-APR-2020 22-APR-2020
 Analysis Type: AIR Init. Cal. Times: 13:35 13:27
 Lab Sample ID: CCV Quant Type: ISTD
 Method: /chem/msdv.i/30APR20.b/v2010408b.m

COMPOUND	RRF / AMOUNT	RF10	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE
\$ 117 1,2-Dichloroethane-d4	1.56952	1.43401	0.010	8.63388	30.00000	Averaged
119 tert-Amyl methyl ether	0.26402	0.28660	0.010	-6.27898	40.00000	Averaged
120 1,2-Dichloroethane	0.59261	0.67479	0.010	-13.86664	30.00000	Averaged
121 Heptane	0.34448	0.39335	0.010	-14.18575	30.00000	Averaged
125 Trichloroethene	0.52762	0.67300	0.010	-27.55276	30.00000	Averaged
127 Methylcyclohexane	0.72560	0.77243	0.010	-6.45465	40.00000	Averaged
132 1,2-Dichloropropane	0.46511	0.52325	0.010	-12.50063	30.00000	Averaged
136 1,4-Dioxane	0.31473	0.31599	0.010	-0.40088	30.00000	Averaged
138 Bromodichloromethane	1.07479	1.20336	0.010	-11.96257	30.00000	Averaged
144 cis-1,3-Dichloropropene	0.73638	0.72313	0.010	1.79861	30.00000	Averaged
145 4-Methyl-2-pentanone	0.90816	0.91686	0.010	-0.95779	30.00000	Averaged
\$ 146 Toluene-d8	1.00406	1.02617	0.010	-2.20181	30.00000	Averaged
147 Toluene	1.44895	1.58715	0.010	-9.53765	30.00000	Averaged
150 trans-1,3-Dichloropropene	0.80428	0.80696	0.010	-0.33344	30.00000	Averaged
155 1,1,2-Trichloroethane	0.58499	0.68305	0.010	-16.76370	30.00000	Averaged
156 Tetrachloroethene	0.76394	0.86119	0.010	-12.72967	30.00000	Averaged
158 2-Hexanone	0.51204	0.51693	0.010	-0.95416	30.00000	Averaged
160 Dibromochloromethane	1.02102	1.15933	0.010	-13.54636	30.00000	Averaged
161 1,2-Dibromoethane (EDB)	0.95370	1.05078	0.010	-10.18015	30.00000	Averaged
165 Chlorobenzene	1.24984	1.33247	0.010	-6.61184	30.00000	Averaged
167 Ethyl Benzene	0.65511	0.63663	0.010	2.82011	30.00000	Averaged
169 m,p-Xylene	0.72596	0.73050	0.010	-0.62496	30.00000	Averaged
171 o-Xylene	0.68674	0.65735	0.010	4.28083	30.00000	Averaged
172 Styrene	1.08973	1.06454	0.010	2.31205	30.00000	Averaged
174 Bromoform	0.90631	0.95788	0.010	-5.68978	30.00000	Averaged
175 Cumene	2.11604	2.05567	0.010	2.85324	30.00000	Averaged
\$ 177 4-Bromofluorobenzene	0.53243	0.48330	0.010	9.22646	30.00000	Averaged
181 1,1,2,2-Tetrachloroethane	1.04437	1.00302	0.010	3.95926	30.00000	Averaged
182 Propylbenzene	2.43610	2.52731	0.010	-3.74392	30.00000	Averaged
188 4-Ethyltoluene	1.98896	2.08823	0.010	-4.99107	30.00000	Averaged
190 1,3,5-Trimethylbenzene	1.96998	2.04527	0.010	-3.82190	30.00000	Averaged
196 1,2,4-Trimethylbenzene	1.59050	1.59265	0.010	-0.13525	30.00000	Averaged
208 1,3-Dichlorobenzene	0.87596	0.92457	0.010	-5.54882	30.00000	Averaged
209 1,4-Dichlorobenzene	0.84350	0.89777	0.010	-6.43493	30.00000	Averaged
212 alpha-Chlorotoluene	0.81195	0.70986	0.010	12.57400	30.00000	Averaged

US32TAR1

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdv.i Injection Date: 30-APR-2020 23:33
Lab File ID: v043023a.d Init. Cal. Date(s): 08-APR-2020 22-APR-2020
Analysis Type: AIR Init. Cal. Times: 13:35 13:27
Lab Sample ID: CCV Quant Type: ISTD
Method: /chem/msdv.i/30APR20.b/v2010408b.m

COMPOUND	RRF / AMOUNT	RF10	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE
214 1,2-Dichlorobenzene	0.72928	0.79165	0.010	-8.55303	30.00000	Averaged
226 1,2,4-Trichlorobenzene	0.35662	0.38427	0.010	-7.75350	30.00000	Averaged
227 Hexachlorobutadiene	0.38536	0.50725	0.010	-31.62807	30.00000	Averaged
228 Naphthalene	0.35890	0.26627	0.010	25.80935	30.00000	Averaged

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	Lab Blank	Date/Time Analyzed:	4/30/20 11:33 AM
Lab ID:	2004368-03A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdv.i / v043006d
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trichlorobenzene	120-82-1	1.3	3.0	3.7	3.0 U
1,2,4-Trimethylbenzene	95-63-6	0.11	0.39	0.49	0.39 U
1,2-Dichlorobenzene	95-50-1	0.11	0.48	0.60	0.48 U
1,2-Dichloropropane	78-87-5	0.11	0.37	0.46	0.37 U
1,3,5-Trimethylbenzene	108-67-8	0.098	0.39	0.49	0.39 U
1,3-Butadiene	106-99-0	0.048	0.18	0.22	0.18 U
1,3-Dichlorobenzene	541-73-1	0.21	0.48	0.60	0.48 U
1,4-Dioxane	123-91-1	0.19	0.29	0.36	0.29 U
2,2,4-Trimethylpentane	540-84-1	0.41	1.9	2.3	1.9 U
2-Butanone (Methyl Ethyl Ketone)	78-93-3	0.30	1.2	1.5	1.2 U
2-Hexanone	591-78-6	0.52	1.6	2.0	1.6 U
2-Propanol	67-63-0	0.14	0.98	1.2	0.98 U
3-Chloropropene	107-05-1	0.57	1.2	1.6	1.2 U
4-Ethyltoluene	622-96-8	0.11	0.39	0.49	0.39 U
4-Methyl-2-pentanone	108-10-1	0.10	0.33	0.41	0.33 U
Acetone	67-64-1	0.40	0.95	2.4	0.49 J
alpha-Chlorotoluene	100-44-7	0.10	0.41	0.52	0.41 U
Bromodichloromethane	75-27-4	0.24	0.54	0.67	0.54 U
Bromoform	75-25-2	0.24	0.83	1.0	0.83 U
Bromomethane	74-83-9	0.34	1.6	1.9	1.6 U
Carbon Disulfide	75-15-0	0.27	1.2	1.6	1.2 U
Chlorobenzene	108-90-7	0.12	0.37	0.46	0.37 U
cis-1,3-Dichloropropene	10061-01-5	0.091	0.36	0.45	0.36 U
Cumene	98-82-8	0.076	0.39	0.49	0.39 U

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	Lab Blank	Date/Time Analyzed:	4/30/20 11:33 AM
Lab ID:	2004368-03A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdv.i / v043006d
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Cyclohexane	110-82-7	0.093	0.28	1.7	0.28 U
Dibromochloromethane	124-48-1	0.26	0.68	0.85	0.68 U
Ethanol	64-17-5	0.20	0.75	1.9	0.75 U
Freon 11	75-69-4	0.12	0.45	0.56	0.45 U
Freon 113	76-13-1	0.15	0.61	0.77	0.61 U
Heptane	142-82-5	0.14	1.6	2.0	1.6 U
Hexachlorobutadiene	87-68-3	1.8	4.3	5.3	4.3 U
Hexane	110-54-3	0.20	1.4	1.8	1.4 U
Methylene Chloride	75-09-2	0.10	0.28	0.69	0.28 U
Propylbenzene	103-65-1	0.12	0.39	0.49	0.39 U
Styrene	100-42-5	0.046	0.34	0.42	0.34 U
Tetrahydrofuran	109-99-9	0.59	1.2	1.5	1.2 U
trans-1,3-Dichloropropene	10061-02-6	0.11	0.36	0.45	0.36 U

U = The analyte was not detected above the MDL.

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	80-142	104
4-Bromofluorobenzene	460-00-4	72-122	98
Toluene-d8	2037-26-5	84-116	99

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
 NWIRP Bethpage

Client ID:	Lab Blank	Date/Time Analyzed:	4/30/20 11:33 AM
Lab ID:	2004368-03B	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdv.i / v043006simd
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	71-55-6	0.033	0.098	0.11	0.098 U
1,1,2,2-Tetrachloroethane	79-34-5	0.045	0.12	0.14	0.12 U
1,1,2-Trichloroethane	79-00-5	0.033	0.098	0.11	0.098 U
1,1-Dichloroethane	75-34-3	0.027	0.073	0.081	0.073 U
1,1-Dichloroethene	75-35-4	0.032	0.036	0.040	0.036 U
1,2-Dibromoethane (EDB)	106-93-4	0.024	0.14	0.38	0.055 J
1,2-Dichloroethane	107-06-2	0.015	0.073	0.081	0.015 J
1,4-Dichlorobenzene	106-46-7	0.068	0.11	0.30	0.069 J
Benzene	71-43-2	0.094	0.096	0.16	0.096 U
Carbon Tetrachloride	56-23-5	0.058	0.11	0.12	0.11 U
Chloroethane	75-00-3	0.020	0.079	0.13	0.079 U
Chloroform	67-66-3	0.028	0.088	0.098	0.088 U
Chloromethane	74-87-3	0.025	0.062	1.0	0.062 U
cis-1,2-Dichloroethene	156-59-2	0.028	0.071	0.079	0.071 U
Ethyl Benzene	100-41-4	0.057	0.078	0.087	0.078 U
Freon 114	76-14-2	0.041	0.12	0.14	0.12 U
Freon 12	75-71-8	0.025	0.089	0.25	0.089 U
m,p-Xylene	108-38-3	0.10	0.13	0.17	0.13 U
Methyl tert-butyl ether	1634-04-4	0.031	0.11	0.36	0.11 U
o-Xylene	95-47-6	0.019	0.078	0.087	0.078 U
Tetrachloroethene	127-18-4	0.026	0.12	0.14	0.12 U
Toluene	108-88-3	0.057	0.11	0.19	0.11 U
trans-1,2-Dichloroethene	156-60-5	0.030	0.12	0.40	0.12 U
Trichloroethene	79-01-6	0.073	0.097	0.11	0.097 U

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Appendix C

Support Documents

B. Chain of Custody (COC)

V@Áæ^Ác}á}á^Á-á|á\Á



Air Toxic

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

PID: Workorder #:

2004368

page--of --

Client: Tetra Tech
Project Name: NWIRP Bath page
Project Manager: Dave Draycott
Sampler: Vin Varricchio
Site Name: VPB-180
Special Instructions/Notes:
Turnaround Time (Rush surcharges may apply)
Standard X Rush (specify)
Canister Vacuum/Pressure
Requested Analyses
Lab Use Only

Table with columns: Lab ID, Field Sample Identification(Location), Can #, Flow Controller #, Start Sampling Information (Date, Time), Stop Sampling Information (Date, Time), Initial (in Hg), Final (in Hg), Receipt, Final (psig) Gas: N2 / He, Requested Analyses. Includes rows for samples 01A and 02A.

Relinquished by: (Signature/Affiliation) Date Time Received by: (Signature/Affiliation) Date Time
Includes handwritten signatures and dates for sample 01A and 02A.

Shipper Name: FedEx Custody Seals Intact? Yes No None
Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind.

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Appendix C

Support Documents

C. Calculations for Stage 4 Data Validation

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SDG 2004368

Verification calculations follow the written formula with the verification results compared to the reported value, verification value vs. reported value.

VOC (TO-15) SAMPLE QUANTITATION

acetone for BP-VPB180-AIR-UW-20200416

$\text{Area}_c(\text{Conc}_{std})(DL)(MW)/\text{Area}_{st}$

Calc. Concentration = 5.26

AREA c	AREA st	CONC istd	RRF	DL	Mw	GasC
15209	86843	5	0.66504	1.68	58.08	24.45

Reported Concentration = 5.2

V@Áæ^Ác}á}á^Á-á|á\Á

7. VPB180 Air Sample Analytical Data Validated Table

V@Áæ^Ác}á}á^Á-á|á\Á

LOCATION	VPB180	VPB180
SAMPLE ID	BP-VPB180-AIR-DW-2020041	BP-VPB180-AIR-UW-2020041
SAMPLE DATE	4/16/2020	4/16/2020
SAMPLE TYPE	Downwind	Upwind
VOLATILE ORGANICS (UG/M3)		
1,1,1-TRICHLOROETHANE	0.16 U	0.16 U
1,1,2,2-TETRACHLOROETHANE	0.2 U	0.21 U
1,1,2-TRICHLOROETHANE	0.16 U	0.16 U
1,1,2-TRICHLOROTRIFLUOROETHANE	0.56 J	0.53 J
1,1-DICHLOROETHANE	0.12 U	0.12 U
1,1-DICHLOROETHENE	0.058 U	0.06 U
1,2,4-TRICHLOROBENZENE	4.9 U	5 U
1,2,4-TRIMETHYLBENZENE	0.64 U	0.66 U
1,2-DIBROMOETHANE	0.23 U	0.23 U
1,2-DICHLOROBENZENE	0.79 U	0.81 U
1,2-DICHLOROETHANE	0.13 U	0.14 U
1,2-DICHLOROPROPANE	0.61 U	0.62 U
1,2-DICHLOROTETRAFLUOROETHANE	0.11 J	0.11 J
1,3,5-TRIMETHYLBENZENE	0.64 U	0.66 U
1,3-BUTADIENE	0.29 U	0.3 U
1,3-DICHLOROBENZENE	0.79 U	0.81 U
1,4-DICHLOROBENZENE	0.18 U	0.18 U
1,4-DIOXANE	0.47 U	0.48 U
1-ETHYL-4-METHYL BENZENE	0.64 U	0.66 U
2,2,4-TRIMETHYLPENTANE	3.1 U	3.1 U
2-BUTANONE	0.62 J	2 U
2-HEXANONE	2.7 U	2.8 U
3-CHLOROPROPENE	2 U	2.1 U
4-METHYL-2-PENTANONE	0.54 U	0.55 U
ACETONE	7.3	5.2
BENZENE	0.42	0.45
BENZYL CHLORIDE	0.68 U	0.7 U
BROMODICHLOROMETHANE	0.88 U	0.9 U
BROMOFORM	1.4 U	1.4 U
BROMOMETHANE	2.5 U	2.6 U
CARBON DISULFIDE	2 U	2.1 U
CARBON TETRACHLORIDE	0.42	0.38
CHLOROBENZENE	0.6 U	0.62 U
CHLORODIBROMOMETHANE	1.1 U	1.1 U
CHLOROETHANE	0.13 U	0.13 U
CHLOROFORM	0.079 J	0.078 J
CHLOROMETHANE	1 J	1 J
CIS-1,2-DICHLOROETHENE	0.12 U	0.12 U
CIS-1,3-DICHLOROPROPENE	0.6 U	0.61 U
CYCLOHEXANE	0.45 U	0.46 U
DICHLORODIFLUOROMETHANE	2.2	2.2
ETHANOL	4	2.5 J
ETHYLBENZENE	0.13 U	0.13 U
HEXACHLOROBUTADIENE	7 UJ	7.2 UJ
HEXANE	2.3 U	2.4 U
ISOPROPANOL	0.69 J	1.6 U
ISOPROPYLBENZENE	0.64 U	0.66 U
M+P-XYLENES	0.21 U	0.26 J
METHYL TERT-BUTYL ETHER	0.18 U	0.18 U
METHYLENE CHLORIDE	0.59 J	0.38 J
N-HEPTANE	2.7 U	2.8 U
N-PROPYLBENZENE	0.64 U	0.66 U
O-XYLENE	0.06 J	0.1 J
STYRENE	0.56 U	0.57 U
TETRACHLOROETHENE	0.047 J	0.2 U
TETRAHYDROFURAN	1.9 U	2 U
TOLUENE	0.31 J	0.53
TRANS-1,2-DICHLOROETHENE	0.2 U	0.2 U
TRANS-1,3-DICHLOROPROPENE	0.6 U	0.61 U
TRICHLOROETHENE	0.16 U	0.16 U
TRICHLOROFUOROMETHANE	1.2	1.3
VINYL CHLORIDE	0.038 U	0.039 U

Notes:

UG/M3 = micrograms per meter cubed

U = Undetected. The parameter was analyzed but undetected at the listed limit of quantitation or was qualified as undetected during data review due to blank artifacts.

J = Estimated value. One or more quality control parameters were outside control limits or the analyte concentration was less than the limit of quantitation

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APPENDIX B
TT-MW180D, TT-MW180D1, AND TT-MW180D2

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TT-MW180D, TT-MW180D1, and TT-MW180D2

- 1. TT-MW180D, TT-MW180D1, and TT-MW180D2 Boring Logs**
- 2. TT-MW180D, TT-MW180D1, and TT-MW180D2 Well Construction Logs**
- 3. TT-MW180D, TT-MW180D1, and TT-MW180D2 Well Development/Groundwater Sample Log Sheets**
- 4. TT-MW180D, TT-MW180D1, and TT-MW180D2 Analytical Data Unvalidated**
- 5. TT-MW180D, TT-MW180D1, and TT-MW180D2 Analytical Data Table Unvalidated**

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1. TT-MW180D, TT-MW180D1, and TT-MW180D2 Boring Logs

V@Áæ^Ác}á}á^Á-á|á\Á



Tetra Tech

WELL NUMBER TT-MW180D

PAGE 1 OF 2

CLIENT NAVFAC MIDLANT **PROJECT NAME** NWIRP Bethpage OU2
PROJECT NUMBER 112G08005-WE13 **PROJECT LOCATION** BETHPAGE
DATE STARTED 6/11/20 **COMPLETED** 6/12/20 **GROUND ELEVATION** 71.2 **HOLE SIZE** 8.625 inches
DRILLING CONTRACTOR DELTA WELL & PUMP **DRILLING METHOD** MUD ROTARY
GROUND WATER LEVEL --- **LOGGED BY** V Varricchio
NORTHING 200999.3 ft **EASTING** 1124946.4 ft **DATUM:** NVD 88
NOTES Hollow Stem Auger first 50 feet

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0						0-223 ft bgs: See VPB180 for Descriptions	Casing Top Elev: 70.75 (ft) Casing Type: PVC Top of Casing - 10" Diameter Steel Casing Bentonite Cement Grout Bentonite Seal Secondary Sand Pack #0 Primary Sand
10							
20							
30							
40							
50							
60							
70							
80							
90							
100							
110							
120							
130							
140							
150							
160							
170							
180							
190							
200							
210							
220							

TT MW BORING-MW CONSTRUCTION - GINT STD US LAB GDT - 5/26/21 14:57 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
						0-223 ft bgs: See VPB180 for Descriptions (continued)	
	SS	14.5	11-15-18-16/0"	SP		223.0 225.0 (SP) Orange/brown poorly graded fine SAND, wet	-151.8 -153.8
230	SS	12.5	6-8-7-9/0"	SP		(SP) Orange/brown poorly graded fine SAND, few dark grey Clay, wet	-158.8
	SS	12	3-6-11-8/0"	SP		(SP) Grey/brown poorly graded fine SAND, wet	-163.8
240	SS	16	9-11-12-18/0"	SP		(SP) Grey poorly graded fine SAND, few Silt, wet	-168.8
250							

-4" Diameter Schedule 80 PVC, 10 Slot Well Screen (220-240 ft bgs)

-Sump

-Sand to Bottom

Bottom of borehole at 258.0 feet.

TT MW BORING-MW CONSTRUCTION - GINT STD US LAB.GDT - 5/26/21 14:58 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ



CLIENT NAVFAC MIDLANT PROJECT NAME NWIRP Bethpage OU2
 PROJECT NUMBER 112G08005-WE13 PROJECT LOCATION BETHPAGE
 DATE STARTED 6/4/20 COMPLETED 6/5/20 GROUND ELEVATION 71.3 HOLE SIZE 7.625 inches
 DRILLING CONTRACTOR DELTA WELL & PUMP DRILLING METHOD MUD ROTARY
 GROUND WATER LEVEL --- LOGGED BY Beau Benfield
 NORTHING 201013.9 ft EASTING 1124945.6 ft DATUM: NVD 88
 NOTES Hollow Stem Auger first 50 feet

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0							Casing Top Elev: 70.96 (ft) Casing Type: PVC
10						0-583 ft bgs: See VPB180 for Descriptions	Top of Casing
20							- 10" Diamter Steel Casing
30							
40							
50							
60							
70							
80							
90							
100							
110							
120							
130							
140							
150							
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400							
410							
420							
430							
440							
450							
460							
470							
480							
490							
500							
510							
520							
530							
540							
550							
560							Bentonite Seal Secondary

TT MW BORING-MW CONSTRUCTION - GINT STD US LAB GDT - 5/26/21 14:57 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
570						0-583 ft bgs: See VPB180 for Descriptions (continued)	<p>- Primary Sand Pack #1</p> <p>- 4" Diameter Schedule 80 PVC, 10 Slot Well Screen (580-600 ft bgs)</p> <p>- Sump</p> <p>- Sand to Bottom</p>
583.0	SS 10	7-11-16-29/0"	SPSW	(SPSW) Light gray/light brown poorly graded fine to medium SAND, some coarse Sand, trace silt	-511.7 to -513.7		
590	SS 18	13-19-26-14/0"	SPSW	(SPSW) Mottled gray poorly graded fine to medium SAND, little Silt, wet	-518.7		
595.0	SS 15	12-28-35-36/0"	SPSW	(SPSW) Light brown poorly graded fine to medium SAND, trace Silt, wet	-523.7		
600	SS 24	19-22-20-14/0"	SPSW	(SPSW) Mottled gray poorly graded fine to medium SAND with Silt, wet	-528.7		

Bottom of borehole at 618.0 feet.

TT MW BORING-MW CONSTRUCTION - GINT STD US LAB GDT - 5/26/21 14:58 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ



Tetra Tech

WELL NUMBER TT-MW180D2

PAGE 1 OF 3

CLIENT NAVFAC MIDLANT **PROJECT NAME** NWIRP Bethpage OU2
PROJECT NUMBER 112G08005-WE13 **PROJECT LOCATION** BETHPAGE
DATE STARTED 6/19/20 **COMPLETED** 6/20/20 **GROUND ELEVATION** 71.0 **HOLE SIZE** 8.625 inches
DRILLING CONTRACTOR DELTA WELL & PUMP **DRILLING METHOD** MUD ROTARY
GROUND WATER LEVEL --- **LOGGED BY** V Varricchio
NORTHING 200969 ft **EASTING** 1124947.2 ft **DATUM:** NVD 88
NOTES Hollow Stem Auger first 50 feet

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0							Casing Top Elev: 70.67 (ft) Casing Type: PVC
10						0-713 ft bgs: See VPB180 for Descriptions	Top of Casing
20							- 10" Diameter Steel Casing
30							
40							
50							
60							
70							
80							
90							
100							
110							
120							
130							
140							
150							
160							
170							
180							
190							
200							
210							
220							
230							
240							
250							
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270							
280							
290							
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320							
330							
340							
350							
360							
370							
380							
390							
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410							
420							
430							
440							
450							
460							
470							
480							
490							
500							
510							
520							
530							
540							
550							
560							
570							
580							
590							
600							
610							
620							
630							
640							
650							
660							
670							- Bentonite

TT MW BORING-MW CONSTRUCTION - GINT STD US LAB GDT - 5/26/21 14:57 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

(Continued Next Page)



CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

TT MW BORING-MW CONSTRUCTION - GINT STD US LAB GDT - 5/26/21 14:58 - P:\GINT FILES\PROJECTS\BETHPAGE\BP_NIRIS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
680						0-713 ft bgs: See VPB180 for Descriptions (continued)	
690							
700							
710							
	SS	4	23-26-19-24/0"	SW		713.0 (SW) Tan to orange brown well graded fine to coarse SAND and subrounded Pebbles 715.0	-642.0 -644.0
	SS	4	33-36-29-28/0"	SW		(SW) Light tan to white well graded fine to coarse SAND and subrounded Pebbles 720.0	-649.0
	SS	2	18-22-24-23/0"	SW		(SW) Light tan to white well graded fine to coarse SAND and subrounded Pebbles 725.0	-654.0
	SS	7	6-22-30-34/0"	SPGP		(SPGP) Tan poorly graded fine SAND, few subrounded Pebbles 730.0	-659.0
730							

- Primary Sand Pack #1

- 4" Diameter Schedule 80 PVC, 10 Slot Well Screen (710-730 ft bgs)

- Sump



Tetra Tech

WELL NUMBER TT-MW180D2

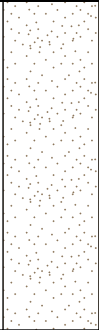
PAGE 3 OF 3

CLIENT NAVFAC MIDLANT

PROJECT NAME NWIRP Bethpage OU2

PROJECT NUMBER 112G08005-WE13

PROJECT LOCATION BETHPAGE

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
740							 <p>- Sand to Bottom</p>

Bottom of borehole at 748.0 feet.

TT MW BORING-MW CONSTRUCTION - GINT STD US LAB.GDT - 5/26/21 14:58 - P:\GINT FILES\PROJECTS\BETHPAGEBP_NIRIS.GPJ

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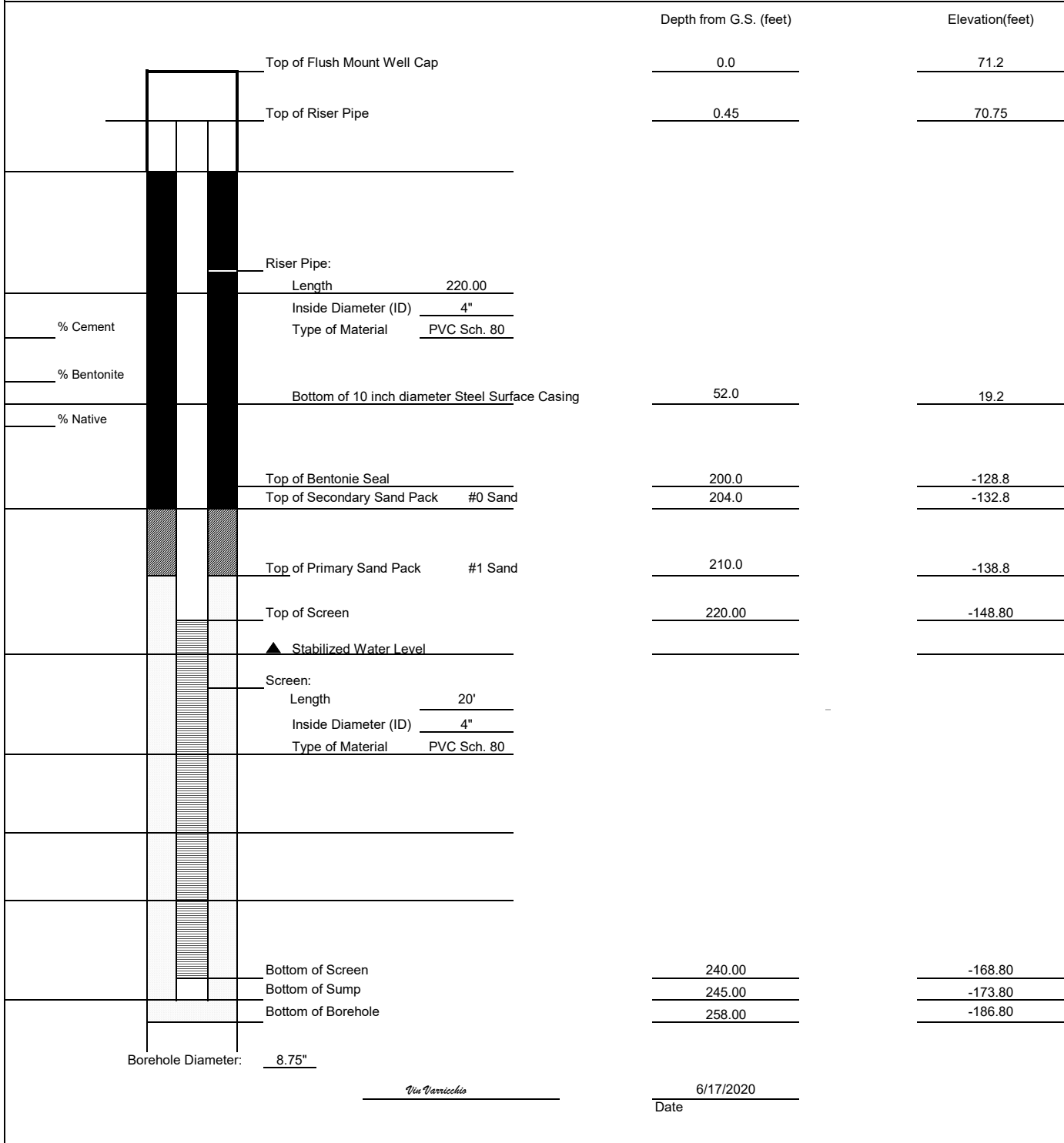
2. TT-MW180D, TT-MW180D1, and TT-MW180D2 Well Construction Logs

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Client: NAVFAC	WELL ID: BP-TT-MW180D
Project Number: 112G08005-WE13	
Site Location: NWIRP BETHPAGE, NY	Date Installed: 6/17/2020
Well Location: On-Site	Inspector: Varricchio
Method: Hollow Stem Auger (0'-50') Mud Rotary (>50')	Contractor: Delta Well & Pump

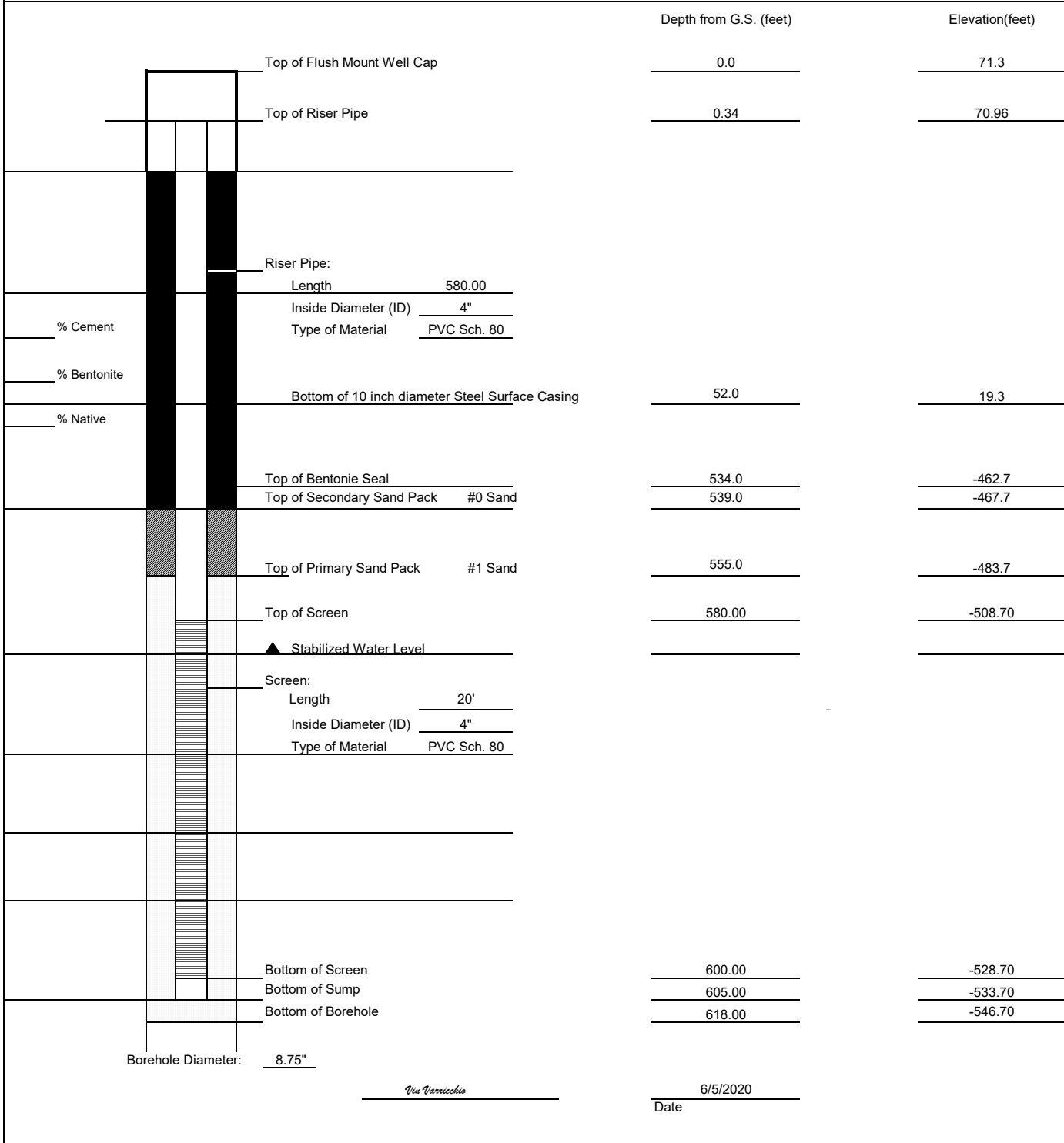
MONITORING WELL CONSTRUCTION DETAIL





Client: NAVFAC	WELL ID: BP-TT-MW180D1
Project Number: 112G08005-WE13	
Site Location: NWIRP BETHPAGE, NY	Date Installed: 6/5/2020
Well Location: On-Site	Inspector: Varricchio
Method: Hollow Stem Auger (0'-50') Mud Rotary (>50')	Contractor: Delta Well & Pump

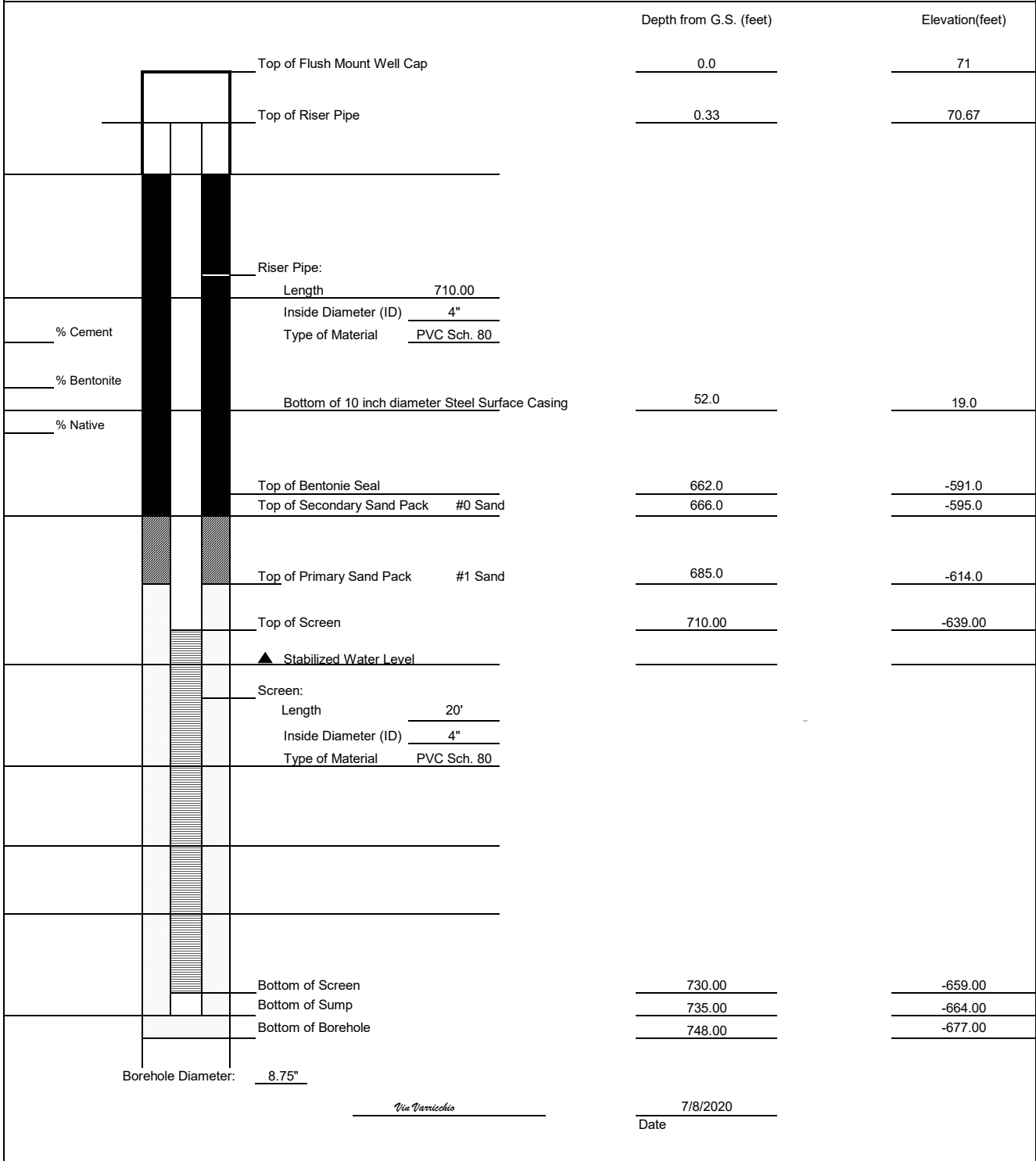
MONITORING WELL CONSTRUCTION DETAIL





<i>Client:</i>	NAVFAC	WELL ID: BP-TT-MW180D2
<i>Project Number:</i>	112G08005-WE13	
<i>Site Location:</i>	NWIRP BETHPAGE, NY	<i>Date Installed:</i> 7/8/2020
<i>Well Location:</i>	On-Site	<i>Inspector:</i> Varricchio
<i>Method:</i>	Hollow Stem Auger (0'-50') Mud Rotary (>50')	<i>Contractor:</i> Delta Well & Pump

MONITORING WELL CONSTRUCTION DETAIL



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**3. TT-MW180D, TT-MW180D1, and TT-MW180D2 Well Development/Groundwater
Sample Log Sheets**

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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D Well Development
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: 220'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/20/20
MS/MSD Collected: YES NO	Sample Time: 12:05

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:05	-	-	Clear	5.47	189.1	1.73	16.1	17	188.6	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: 225'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/20/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 12:20

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:20	-	-	Clear	5.55	183.4	4.45	9.13	16.4	162.6	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
			<i>B Benfield</i>

GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: 230'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/20/20
MS/MSD Collected: YES NO	Sample Time: 12:35

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:35	-	-	Clear	5.43	179.9	3.78	5.13	15.8	166.6	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D Well Development
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: 235'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/20/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input type="checkbox"/>	Sample Time: 12:05

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:05	-	-	Clear	5.44	180.3	4.66	5.01	16	171.2	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: BP-TT-MW180D-GW-20200720 (240')	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/20/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 13:05

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
13:05	-	-	Clear	5.31	190.4	2.62	5.22	17	174.9	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	8260	HCl	2	40 ml	VOA	X	
1,4-dioxane	8270-SIM	None	1	1 Liter	Amber	X	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
			<i>B Benfield</i>

GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D1 Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: 580'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/20/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 13:30

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
13:30	-	-	Clear	7.39	275.7	1.11	48.8	13.3	180.7	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D1 Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: 585'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/20/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 9:00

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
9:00	-	-	Clear	6.7	152	1.5	89.6	14.3	208.9	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D1 Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: 590'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/20/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 9:45

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
9:45	-	-	Clear	5.44	70	3.34	81.6	15.7	195.2	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D1 Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: 590'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/20/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 10:05

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
10:05	-	-	Clear	5.45	63	3.58	68.1	14.3	205.6	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D1 Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: BP-TT-MW180D1-GW-20200720 (600')	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/20/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 10:45

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
10:45	-	-	Clear	5.34	68.1	1.6	45.2	17	212.3	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	8260	HCl	2	40 ml	VOA	X	
1,4-dioxane	8270-SIM	None	1	1 Liter	Amber	X	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
			<i>B Benfield</i>

GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D2 Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: 710'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/22/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 10:45

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
10:45	-	-	Clear	6.86	142.8	5.61	96.4	17.9	156.8	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D2 Well Development
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: 715'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/22/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 11:30

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
11:30	-	-	Clear	5.69	72.5	5.87	89.6	15.3	209.5	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
			<i>B Benfield</i>

GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D2 Well Development
 Project Site Name: NWIRP Bethpage
 Project No.: 112G08005-WE13

Sample ID: 720'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/22/20
MS/MSD Collected: YES NO	Sample Time: 12:00

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:00	-	-	Clear	5.69	68.8	5.72	72.4	15.1	202.1	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D2 Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: 725'	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/22/20
MS/MSD Collected: YES NO	Sample Time: 12:30

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:30	-	-	Clear	5.72	71.7	5.49	26.4	15.3	197.3	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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GROUNDWATER SAMPLE LOG SHEET



Event: MW-180D2 Well Development
Project Site Name: NWIRP Bethpage
Project No.: 112G08005-WE13

Sample ID: BP-TT-MW180D2-GW-20200722 (730')	Sampled By: Benfield
QA/QC Duplicate ID:	Sample Date: 07/22/20
MS/MSD Collected: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Sample Time: 12:30

WELL INFORMATION:	
Well ID :	Purge Date:
Well Diameter (in):	Static Water Level (ft-BTOR):
Top of Screen (ft-BTOR):	PID Monitor Reading:
Bottom of Screen (ft-BTOR):	Purge Method:
Total Well Depth (ft-BTOR):	Sample Method:

EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 556	Pump Controller:
Turbidity Meter: Hanna 98703	

WATER QUALITY DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (uS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
12:30	-	-	Clear	5.72	71.7	5.49	26.4	15.3	197.3	-	

FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS							
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected	
VOC	8260	HCl	2	40 ml	VOA	X	
1,4-dioxane	8270-SIM	None	1	1 Liter	Amber	X	

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s): <i>B Benfield</i>
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V@Áæ^Ác}q}qÁ-ó|æ\Á

4. TT-MW180D, TT-MW180D1, and TT-MW180D2 Analytical Data Unvalidated

V@Áæ^Ác}á}á^Á-á|á\Á

DATA FOR
VOLATILE ORGANICS
SEMI-VOLATILE ORGANICS

PROJECT NAME : CTO WE13

TETRA TECH NUS, INC.
661 Andersen Drive
Suite 200
Pittsburgh, PA - 15220-2745
Phone No: 412-921-7090

ORDER ID : L3416
ATTENTION : David Brayack





284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Date : 07/27/2020

Dear David Brayack,

4 water samples for the **CTO WE13** project were received on **07/23/2020**. The analytical fax results for those samples requested for an expedited turn around time may be seen in this report. Please contact me if you have any questions or concerns regarding this report.

The invoice for this workorder is also attached to the e-mail.

Regards,

Steven T Chaimowitz

s.chaim@chemtech.net

Chemtech Project Number: L3416

COC Number:

CLIENT INFORMATION

PROJECT INFORMATION

BILLING INFORMATION

COMPANY: Tetra Tech
ADDRESS: 5700 Lake Wright Dr., Suite 102
CITY: Norfolk STATE: VA ZIP: 23502
ATTENTION: Dave Brayack
PHONE: 757-466-4909 FAX: 757-461-4148

PROJECT NAME: NWIRP Bethpage
PROJECT #: 112G08005-WE13 LOCATION: VPB-180
PROJECT MANAGER: Dave Brayack
E-MAIL: david.brayack@tetratech.com
PHONE: 757-466-4909 FAX: 757-461-4148

BILL TO: SEE CONTRACT PO#
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

DATA DELIVERABLE INFORMATION

FAX: _____ 2 _____ DAYS*
HARD COPY: _____ 2 _____ DAYS*
EDD _____ 2 _____ DAYS*
* TO BE APPROVED BY CHEMTECH
STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

- RESULTS ONLY
- RESULTS + QC
- New Jersey REDUCED
- New Jersey CLP
- EDD Format
- USEPA CLP
- New York State ASP "B"
- New York State ASP "A"
- Other _____

ANALYSIS

VOC(SW846-8260B)	1,4-Dioxane (8270-SIM)								
1	2	3	4	5	6	7	8	9	

PRESERVATIVES

COMMENTS

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# of Bottles	PRESERVATIVES									COMMENTS <-- Specify Preservatives A-HCl B-HNO3 C-H2SO4 D-NaOH E-ICE F-Other		
			COMP	GRAB	DATE	TIME		A	E										
								1	2	3	4	5	6	7	8	9			
1.	BP-TT-MW180D2-GW-20200722			X	7/22/20	13:00	3	2	1										
2.	BP-TT-MW180D1-GW-20200720			X	7/20/20	10:45	3	2	1										
3.	BP-TT-MW180D-GW-20200720			X	7/20/20	1:05	3	2	1										
4.	TB-20200720			X	7/20/20	9:00	2	2											
5.																			
6.																			
7.																			
8.																			
9.																			
10.																			

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE PROSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER 1. <u>[Signature]</u>	DATE/TIME 7/22/20	RECEIVED BY 1. <u>[Signature]</u>	Conditions of bottles or coolers at receipt: <input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Cooler Temp <u>3.4</u> MeOH extraction requires an additional 4oz. Jar for percent solid <input type="checkbox"/> Ice in Cooler? <u>yes</u> Comments: 48hr TAT - For VOC's see worksheet #15 of SAP 2018 for VPB program VOC list
RELINQUISHED BY 2. <u>[Signature]</u>	DATE/TIME 9:35 7-22-20	RECEIVED BY 2. <u>[Signature]</u>	
RELINQUISHED BY 3. <u>[Signature]</u>	DATE/TIME	RECEIVED FOR LAB BY 3. <u>[Signature]</u>	

Page 1 of 1

SHIPPED VIA: CLIENT: Hand Delivered Overnight
CHEMTECH: Picked Up Overnight

Shipment Complete
 YES NO

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/22/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D2-GW-20200722	SDG No.:	L3416
Lab Sample ID:	L3416-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BN011267.D	1	07/24/20 08:45	07/27/20 11:09	PB130451

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	2.60		0.090	0.10	0.10	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.29		30 - 150		72%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.34		30 - 150		84%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.39		55 - 111		97%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.45	*	53 - 106		113%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.54	*	58 - 132		134%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	1990	7.48				
1146-65-2	Naphthalene-d8	6270	10.24				
15067-26-2	Acenaphthene-d10	3840	14.1				
1517-22-2	Phenanthrene-d10	8230	16.87				
1719-03-5	Chrysene-d12	7150	21.09				
1520-96-3	Perylene-d12	6650	23.22				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/22/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D2-GW-20200722	SDG No.:	L3416
Lab Sample ID:	L3416-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017493.D	1		07/23/20 15:36	VX072320

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.55	J	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	38.6		0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	22.0		0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	2.50	J	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	2.40	J	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	3.40	J	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.98	J	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	2.80	J	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	370	E	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.34	J	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.20	J	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.30	J	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/22/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D2-GW-20200722	SDG No.:	L3416
Lab Sample ID:	L3416-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017493.D	1		07/23/20 15:36	VX072320

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	50.8		81 - 118		102%	SPK: 50
1868-53-7	Dibromofluoromethane	48.7		80 - 119		97%	SPK: 50
2037-26-5	Toluene-d8	52.1		89 - 112		104%	SPK: 50
460-00-4	4-Bromofluorobenzene	54.8		85 - 114		110%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	518000	5.64				
540-36-3	1,4-Difluorobenzene	853000	6.83				
3114-55-4	Chlorobenzene-d5	913000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	460000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/22/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D2-GW-20200722DL	SDG No.:	L3416
Lab Sample ID:	L3416-01DL	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017536.D	10		07/24/20 12:42	VX072420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	5.00	UD	2.20	5.00	50.0	ug/L
75-01-4	Vinyl Chloride	5.00	UD	1.70	5.00	50.0	ug/L
74-83-9	Bromomethane	37.5	UD	11.3	37.5	50.0	ug/L
75-00-3	Chloroethane	5.00	UD	3.30	5.00	50.0	ug/L
75-69-4	Trichlorofluoromethane	5.00	UD	2.40	5.00	50.0	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	41.2	JD	1.90	5.00	50.0	ug/L
75-35-4	1,1-Dichloroethene	22.9	JD	2.70	5.00	50.0	ug/L
67-64-1	Acetone	25.0	UD	13.9	25.0	250	ug/L
75-15-0	Carbon Disulfide	5.00	UD	2.30	5.00	50.0	ug/L
1634-04-4	Methyl tert-butyl Ether	5.00	UD	1.90	5.00	50.0	ug/L
75-09-2	Methylene Chloride	5.00	UD	3.20	5.00	50.0	ug/L
156-60-5	trans-1,2-Dichloroethene	5.00	UD	1.40	5.00	50.0	ug/L
75-34-3	1,1-Dichloroethane	5.00	UD	1.50	5.00	50.0	ug/L
78-93-3	2-Butanone	25.0	UD	10.0	25.0	250	ug/L
56-23-5	Carbon Tetrachloride	5.00	UD	2.60	5.00	50.0	ug/L
156-59-2	cis-1,2-Dichloroethene	7.00	JD	2.40	5.00	50.0	ug/L
67-66-3	Chloroform	5.00	UD	1.90	5.00	50.0	ug/L
71-55-6	1,1,1-Trichloroethane	7.50	UD	1.50	7.50	50.0	ug/L
108-87-2	Methylcyclohexane	5.00	UD	1.10	5.00	50.0	ug/L
71-43-2	Benzene	5.00	UD	1.30	5.00	50.0	ug/L
107-06-2	1,2-Dichloroethane	7.50	UD	2.70	7.50	50.0	ug/L
79-01-6	Trichloroethene	410	D	1.30	5.00	50.0	ug/L
78-87-5	1,2-Dichloropropane	5.00	UD	1.10	5.00	50.0	ug/L
75-27-4	Bromodichloromethane	5.00	UD	1.10	5.00	50.0	ug/L
108-10-1	4-Methyl-2-Pentanone	25.0	UD	6.50	25.0	250	ug/L
108-88-3	Toluene	5.00	UD	2.00	5.00	50.0	ug/L
10061-02-6	t-1,3-Dichloropropene	5.00	UD	2.30	5.00	50.0	ug/L
10061-01-5	cis-1,3-Dichloropropene	5.00	UD	1.50	5.00	50.0	ug/L
79-00-5	1,1,2-Trichloroethane	5.00	UD	1.90	5.00	50.0	ug/L
591-78-6	2-Hexanone	37.5	UD	8.20	37.5	250	ug/L
124-48-1	Dibromochloromethane	5.00	UD	1.30	5.00	50.0	ug/L
127-18-4	Tetrachloroethene	5.00	UD	1.30	5.00	50.0	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/22/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D2-GW-20200722DL	SDG No.:	L3416
Lab Sample ID:	L3416-01DL	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017536.D	10		07/24/20 12:42	VX072420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	5.00	UD	1.20	5.00	50.0	ug/L
100-41-4	Ethyl Benzene	5.00	UD	1.20	5.00	50.0	ug/L
179601-23-1	m/p-Xylenes	10.0	UD	2.50	10.0	100	ug/L
95-47-6	o-Xylene	5.00	UD	1.20	5.00	50.0	ug/L
100-42-5	Styrene	5.00	UD	1.60	5.00	50.0	ug/L
75-25-2	Bromoform	5.00	UD	1.80	5.00	50.0	ug/L
98-82-8	Isopropylbenzene	5.00	UD	2.10	5.00	50.0	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	5.00	UD	2.70	5.00	50.0	ug/L
541-73-1	1,3-Dichlorobenzene	5.00	UD	1.60	5.00	50.0	ug/L
106-46-7	1,4-Dichlorobenzene	5.00	UD	1.30	5.00	50.0	ug/L
95-50-1	1,2-Dichlorobenzene	5.00	UD	1.80	5.00	50.0	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	50.5		81 - 118		101%	SPK: 50
1868-53-7	Dibromofluoromethane	51.2		80 - 119		102%	SPK: 50
2037-26-5	Toluene-d8	53.2		89 - 112		106%	SPK: 50
460-00-4	4-Bromofluorobenzene	56.0		85 - 114		112%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	426000	5.63				
540-36-3	1,4-Difluorobenzene	684000	6.83				
3114-55-4	Chlorobenzene-d5	742000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	376000	12.06				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/20/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D1-GW-20200720	SDG No.:	L3416
Lab Sample ID:	L3416-02	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BN011268.D	1	07/24/20 08:45	07/27/20 11:45	PB130451

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	1.90		0.090	0.10	0.10	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.28		30 - 150		69%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.34		30 - 150		84%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.34		55 - 111		85%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.42		53 - 106		105%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.55	*	58 - 132		138%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	2100	7.48				
1146-65-2	Naphthalene-d8	6690	10.24				
15067-26-2	Acenaphthene-d10	4120	14.1				
1517-22-2	Phenanthrene-d10	8650	16.87				
1719-03-5	Chrysene-d12	7510	21.09				
1520-96-3	Perylene-d12	6860	23.22				

U = Not Detected

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D = Dilution

() = Laboratory InHouse Limit

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Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/20/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D1-GW-20200720	SDG No.:	L3416
Lab Sample ID:	L3416-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017494.D	1		07/23/20 15:59	VX072320

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	6.20		0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	4.00	J	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.80	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	1.00	J	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	1.80	J	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	2.70	J	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	2.00	J	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	420	E	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.70	J	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/20/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D1-GW-20200720	SDG No.:	L3416
Lab Sample ID:	L3416-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017494.D	1		07/23/20 15:59	VX072320

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	52.1		81 - 118		104%	SPK: 50
1868-53-7	Dibromofluoromethane	49.0		80 - 119		98%	SPK: 50
2037-26-5	Toluene-d8	48.4		89 - 112		97%	SPK: 50
460-00-4	4-Bromofluorobenzene	48.7		85 - 114		97%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	568000	5.63				
540-36-3	1,4-Difluorobenzene	943000	6.83				
3114-55-4	Chlorobenzene-d5	876000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	459000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

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J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/20/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D1-GW-20200720DL	SDG No.:	L3416
Lab Sample ID:	L3416-02DL	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017537.D	10		07/24/20 13:05	VX072420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	5.00	UD	2.20	5.00	50.0	ug/L
75-01-4	Vinyl Chloride	5.00	UD	1.70	5.00	50.0	ug/L
74-83-9	Bromomethane	37.5	UD	11.3	37.5	50.0	ug/L
75-00-3	Chloroethane	5.00	UD	3.30	5.00	50.0	ug/L
75-69-4	Trichlorofluoromethane	5.00	UD	2.40	5.00	50.0	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	6.60	JD	1.90	5.00	50.0	ug/L
75-35-4	1,1-Dichloroethene	5.00	UD	2.70	5.00	50.0	ug/L
67-64-1	Acetone	25.0	UD	13.9	25.0	250	ug/L
75-15-0	Carbon Disulfide	5.00	UD	2.30	5.00	50.0	ug/L
1634-04-4	Methyl tert-butyl Ether	5.00	UD	1.90	5.00	50.0	ug/L
75-09-2	Methylene Chloride	5.00	UD	3.20	5.00	50.0	ug/L
156-60-5	trans-1,2-Dichloroethene	5.00	UD	1.40	5.00	50.0	ug/L
75-34-3	1,1-Dichloroethane	5.00	UD	1.50	5.00	50.0	ug/L
78-93-3	2-Butanone	25.0	UD	10.0	25.0	250	ug/L
56-23-5	Carbon Tetrachloride	5.00	UD	2.60	5.00	50.0	ug/L
156-59-2	cis-1,2-Dichloroethene	5.00	UD	2.40	5.00	50.0	ug/L
67-66-3	Chloroform	5.00	UD	1.90	5.00	50.0	ug/L
71-55-6	1,1,1-Trichloroethane	7.50	UD	1.50	7.50	50.0	ug/L
108-87-2	Methylcyclohexane	5.00	UD	1.10	5.00	50.0	ug/L
71-43-2	Benzene	5.00	UD	1.30	5.00	50.0	ug/L
107-06-2	1,2-Dichloroethane	7.50	UD	2.70	7.50	50.0	ug/L
79-01-6	Trichloroethene	460	D	1.30	5.00	50.0	ug/L
78-87-5	1,2-Dichloropropane	5.00	UD	1.10	5.00	50.0	ug/L
75-27-4	Bromodichloromethane	5.00	UD	1.10	5.00	50.0	ug/L
108-10-1	4-Methyl-2-Pentanone	25.0	UD	6.50	25.0	250	ug/L
108-88-3	Toluene	5.00	UD	2.00	5.00	50.0	ug/L
10061-02-6	t-1,3-Dichloropropene	5.00	UD	2.30	5.00	50.0	ug/L
10061-01-5	cis-1,3-Dichloropropene	5.00	UD	1.50	5.00	50.0	ug/L
79-00-5	1,1,2-Trichloroethane	5.00	UD	1.90	5.00	50.0	ug/L
591-78-6	2-Hexanone	37.5	UD	8.20	37.5	250	ug/L
124-48-1	Dibromochloromethane	5.00	UD	1.30	5.00	50.0	ug/L
127-18-4	Tetrachloroethene	5.00	UD	1.30	5.00	50.0	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/20/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D1-GW-20200720DL	SDG No.:	L3416
Lab Sample ID:	L3416-02DL	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017537.D	10		07/24/20 13:05	VX072420

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	5.00	UD	1.20	5.00	50.0	ug/L
100-41-4	Ethyl Benzene	5.00	UD	1.20	5.00	50.0	ug/L
179601-23-1	m/p-Xylenes	10.0	UD	2.50	10.0	100	ug/L
95-47-6	o-Xylene	5.00	UD	1.20	5.00	50.0	ug/L
100-42-5	Styrene	5.00	UD	1.60	5.00	50.0	ug/L
75-25-2	Bromoform	5.00	UD	1.80	5.00	50.0	ug/L
98-82-8	Isopropylbenzene	5.00	UD	2.10	5.00	50.0	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	5.00	UD	2.70	5.00	50.0	ug/L
541-73-1	1,3-Dichlorobenzene	5.00	UD	1.60	5.00	50.0	ug/L
106-46-7	1,4-Dichlorobenzene	5.00	UD	1.30	5.00	50.0	ug/L
95-50-1	1,2-Dichlorobenzene	5.00	UD	1.80	5.00	50.0	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	52.3		81 - 118		105%	SPK: 50
1868-53-7	Dibromofluoromethane	51.0		80 - 119		102%	SPK: 50
2037-26-5	Toluene-d8	51.4		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	53.6		85 - 114		107%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	453000	5.63				
540-36-3	1,4-Difluorobenzene	725000	6.83				
3114-55-4	Chlorobenzene-d5	783000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	404000	12.06				

U = Not Detected

LOQ = Limit of Quantitation

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J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/20/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D-GW-20200720	SDG No.:	L3416
Lab Sample ID:	L3416-03	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BN011269.D	1	07/24/20 08:45	07/27/20 12:21	PB130451

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	0.18		0.090	0.10	0.10	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.28		30 - 150		70%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.33		30 - 150		83%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.34		55 - 111		85%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.42		53 - 106		104%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.51		58 - 132		127%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	1870	7.48				
1146-65-2	Naphthalene-d8	6700	10.24				
15067-26-2	Acenaphthene-d10	4070	14.1				
1517-22-2	Phenanthrene-d10	9050	16.87				
1719-03-5	Chrysene-d12	8260	21.09				
1520-96-3	Perylene-d12	7020	23.22				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/20/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D-GW-20200720	SDG No.:	L3416
Lab Sample ID:	L3416-03	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017495.D	1		07/23/20 16:22	VX072320

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	4.20	J	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	3.90	J	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/20/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	BP-TT-MW180D-GW-20200720	SDG No.:	L3416
Lab Sample ID:	L3416-03	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017495.D	1		07/23/20 16:22	VX072320

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	56.0		81 - 118		112%	SPK: 50
1868-53-7	Dibromofluoromethane	45.4		80 - 119		91%	SPK: 50
2037-26-5	Toluene-d8	51.3		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	55.4		85 - 114		111%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	504000	5.64				
540-36-3	1,4-Difluorobenzene	909000	6.84				
3114-55-4	Chlorobenzene-d5	946000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	499000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/20/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	TB-20200720	SDG No.:	L3416
Lab Sample ID:	L3416-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017492.D	1		07/23/20 15:13	VX072320

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.50	U	0.22	0.50	5.00	ug/L
75-01-4	Vinyl Chloride	0.50	U	0.17	0.50	5.00	ug/L
74-83-9	Bromomethane	3.80	U	1.10	3.80	5.00	ug/L
75-00-3	Chloroethane	0.50	U	0.33	0.50	5.00	ug/L
75-69-4	Trichlorofluoromethane	0.50	U	0.24	0.50	5.00	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.50	U	0.19	0.50	5.00	ug/L
75-35-4	1,1-Dichloroethene	0.50	U	0.27	0.50	5.00	ug/L
67-64-1	Acetone	2.50	U	1.40	2.50	25.0	ug/L
75-15-0	Carbon Disulfide	0.50	U	0.23	0.50	5.00	ug/L
1634-04-4	Methyl tert-butyl Ether	0.50	U	0.19	0.50	5.00	ug/L
75-09-2	Methylene Chloride	0.50	U	0.32	0.50	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.50	U	0.14	0.50	5.00	ug/L
75-34-3	1,1-Dichloroethane	0.50	U	0.15	0.50	5.00	ug/L
78-93-3	2-Butanone	2.50	U	1.00	2.50	25.0	ug/L
56-23-5	Carbon Tetrachloride	0.50	U	0.26	0.50	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.50	U	0.24	0.50	5.00	ug/L
67-66-3	Chloroform	0.50	U	0.19	0.50	5.00	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.15	0.75	5.00	ug/L
108-87-2	Methylcyclohexane	0.50	U	0.11	0.50	5.00	ug/L
71-43-2	Benzene	0.50	U	0.13	0.50	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.27	0.75	5.00	ug/L
79-01-6	Trichloroethene	0.50	U	0.13	0.50	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.50	U	0.11	0.50	5.00	ug/L
75-27-4	Bromodichloromethane	0.50	U	0.11	0.50	5.00	ug/L
108-10-1	4-Methyl-2-Pentanone	2.50	U	0.65	2.50	25.0	ug/L
108-88-3	Toluene	0.50	U	0.20	0.50	5.00	ug/L
10061-02-6	t-1,3-Dichloropropene	0.50	U	0.23	0.50	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.50	U	0.15	0.50	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.50	U	0.19	0.50	5.00	ug/L
591-78-6	2-Hexanone	3.80	U	0.82	3.80	25.0	ug/L
124-48-1	Dibromochloromethane	0.50	U	0.13	0.50	5.00	ug/L
127-18-4	Tetrachloroethene	0.50	U	0.13	0.50	5.00	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	07/20/20
Project:	CTO WE13	Date Received:	07/23/20
Client Sample ID:	TB-20200720	SDG No.:	L3416
Lab Sample ID:	L3416-04	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	DB-624UI ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VX017492.D	1		07/23/20 15:13	VX072320

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-90-7	Chlorobenzene	0.50	U	0.12	0.50	5.00	ug/L
100-41-4	Ethyl Benzene	0.50	U	0.12	0.50	5.00	ug/L
179601-23-1	m/p-Xylenes	1.00	U	0.25	1.00	10.0	ug/L
95-47-6	o-Xylene	0.50	U	0.12	0.50	5.00	ug/L
100-42-5	Styrene	0.50	U	0.16	0.50	5.00	ug/L
75-25-2	Bromoform	0.50	U	0.18	0.50	5.00	ug/L
98-82-8	Isopropylbenzene	0.50	U	0.21	0.50	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	0.27	0.50	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.50	U	0.16	0.50	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.50	U	0.13	0.50	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.50	U	0.18	0.50	5.00	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	51.1		81 - 118		102%	SPK: 50
1868-53-7	Dibromofluoromethane	49.9		80 - 119		100%	SPK: 50
2037-26-5	Toluene-d8	51.7		89 - 112		103%	SPK: 50
460-00-4	4-Bromofluorobenzene	56.1		85 - 114		112%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	574000	5.63				
540-36-3	1,4-Difluorobenzene	959000	6.84				
3114-55-4	Chlorobenzene-d5	1000000	10.1				
3855-82-1	1,4-Dichlorobenzene-d4	533000	12.06				
TENTATIVE IDENTIFIED COMPOUNDS							
75-43-4	Dichlorofluoromethane	5.00	U			4.47	ug/L

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

A = Aldol-Condensation Reaction Products

5. TT-MW180D, TT-MW180D1, and TT-MW180D2 Analytical Data Table Unvalidated

V@Áæ^Ác}á}á^Á-á|á\Á

LOCATION SAMPLE ID SAMPLE DATE	BP-TT-MW180D BP-TT-MW180D-GW-20200720 20200720	BP-TT-MW180D1 BP-TT-MW180D1-GW-20200720 20200720	BP-TT-MW180D2 BP-TT-MW180D2-GW-20200722 20200722
SEMIVOLATILES (UG/L)			
1,4-DIOXANE	0.18	1.9	2.6
VOLATILES (UG/L)			
1,1,1-TRICHLOROETHANE	0.75 U	0.75 U	2.8 J
1,1,2,2-TETRACHLOROETHANE	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	0.5 U	1.7 J	1.2 J
1,1,2-TRICHLOROTRIFLUOROETHANE	0.5 U	6.2	38.6
1,1-DICHLOROETHANE	0.5 U	1 J	2.5 J
1,1-DICHLOROETHENE	0.5 U	4 J	22
1,2-DICHLOROBENZENE	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHANE	0.75 U	0.75 U	0.75 U
1,2-DICHLOROPROPANE	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	0.5 U	0.5 U	0.5 U
1,4-DICHLOROBENZENE	0.5 U	0.5 U	0.5 U
2-BUTANONE	2.5 U	2.5 U	2.5 U
2-HEXANONE	3.8 U	3.8 U	3.8 U
4-METHYL-2-PENTANONE	2.5 U	2.5 U	2.5 U
ACETONE	4.2 J	2.8 J	2.5 U
BENZENE	0.5 U	0.5 U	0.5 U
BROMODICHLOROMETHANE	0.5 U	0.5 U	0.5 U
BROMOFORM	0.5 U	0.5 U	0.5 U
BROMOMETHANE	3.8 U	3.8 U	3.8 U
CARBON DISULFIDE	0.5 U	0.5 U	0.5 U
CARBON TETRACHLORIDE	0.5 U	1.8 J	2.4 J
CHLOROBENZENE	0.5 U	0.5 U	0.5 U
CHLORODIBROMOMETHANE	0.5 U	0.5 U	0.5 U
CHLOROETHANE	0.5 U	0.5 U	0.5 U
CHLOROFORM	0.5 U	2 J	0.98 J
CHLOROMETHANE	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	0.5 U	2.7 J	3.4 J
CIS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U
ETHYLBENZENE	0.5 U	0.5 U	0.5 U
ISOPROPYLBENZENE	0.5 U	0.5 U	0.5 U
M+P-XYLENES	1 U	1 U	1 U
METHYL CYCLOHEXANE	0.5 U	0.5 U	0.5 U
METHYL TERT-BUTYL ETHER	0.5 U	0.5 U	0.5 U
METHYLENE CHLORIDE	0.5 U	0.5 U	0.5 U
O-XYLENE	0.5 U	0.5 U	0.5 U
STYRENE	0.5 U	0.5 U	0.5 U
TETRACHLOROETHENE	0.5 U	0.5 U	0.3 J
TOLUENE	0.5 U	0.5 U	0.34 J
TRANS-1,2-DICHLOROETHENE	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	3.9 J	460 D	410 D
TRICHLOROFLUOROMETHANE	0.5 U	0.5 U	0.55 J
VINYL CHLORIDE	0.5 U	0.5 U	0.5 U

V@Áæ^/c}q}ap^Á-á|a\Á

APPENDIX C
SURVEY DATA REPORT

V@Áæ^Ác}á}á^Á-á|á\Á

Borbas Surveying & Mapping, LLC

402 Main Street, Boonton, New Jersey 07005 Phone (973) 316-8743 www.borbas.com

MONITORING WELL CHART

Former Naval Weapons Industrial Reserve Plant (NWIRP)

999 S. Oyster Bay Road (Industrial Park)

Bethpage, New York, 11714

May 11, 2021

Well/Boring ID	Grade Elev	Outer Casing	Inner Casing	Northing	Easting	Latitude North	Longitude West	Survey Date
BPOW1-7	73.2	73.19	72.83	201917.5	1130763.6	40°43'10.85"	73°28'17.21"	3/19/2021
BPOW1-8	73.4	73.37	72.91	201893.5	1130748.6	40°43'10.61"	73°28'17.40"	3/19/2021
MW178I	115.1	115.15	114.75	211974.6	1120872.2	40°44'50.79"	73°30'24.93"	3/19/2021
MW178I1	114.3	114.28	113.88	211943.9	1120871.7	40°44'50.49"	73°30'24.94"	3/19/2021
MW178S	114.7	114.71	114.48	211958.8	1120872.3	40°44'50.64"	73°30'24.93"	3/19/2021
MW179D	118.8	118.82	118.48	213555.0	1120940.8	40°45'06.40"	73°30'23.92"	3/19/2021
MW179D1	119.7	119.70	119.31	213529.9	1120904.7	40°45'06.16"	73°30'24.39"	3/19/2021
MW179D2	119.4	119.40	119.00	213537.6	1120915.8	40°45'06.23"	73°30'24.25"	3/19/2021
MW180D	71.2	71.15	70.75	200999.3	1124946.4	40°43'02.12"	73°29'32.82"	3/19/2021
MW180D1	71.3	71.30	70.96	201013.9	1124945.6	40°43'02.26"	73°29'32.83"	3/19/2021
MW180D2	71.0	71.04	70.67	200969.0	1124947.2	40°43'01.82"	73°29'32.81"	3/19/2021
MW181S	73.1	73.10	72.75	201927.7	1130767.7	40°43'10.95"	73°28'17.15"	3/19/2021
VPB-178	113.7	-	-	211928.4	1120871.0	40°44'50.34"	73°30'24.95"	3/19/2021
VPB-179	119.0	-	-	213549.6	1120933.2	40°45'06.35"	73°30'24.02"	3/19/2021
VPB-180	70.9	-	-	200984.2	1124946.4	40°43'01.97"	73°29'32.83"	3/19/2021
VPB-181	72.9	-	-	201907.2	1130757.5	40°43'10.75"	73°28'17.29"	3/19/2021

Notes:

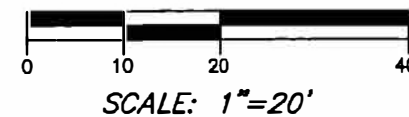
1. The horizontal datum is the New York, Long Island State Plane Coordinate System (NAD83) verified by differential GPS observations utilizing the NGS CORS System on March 18, 2021. Reference Stations: NYBR, NYCI, NYRH and RVDI
2. The vertical datum is the North American Vertical Datum of 1988 (NAVD88) GEOID12A, verified by differential GPS observations from the NGS CORS System on December 17, 2019. Benchmark Reference Stations: NYBR (orthometric height= 42.156'), NYCI (orthometric height= 56.453'), NYVH (orthometric height= 309.251') and SHK6 (orthometric height= 30.141').
3. All coordinates and elevations shown hereon are in U.S. Survey Feet.

John D. Beattie, P.L.S.
 NY License # 050958-1
 May 11, 2021

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E: 1124900
N: 201025

E: 1125000
N: 201025



LEGEND	
	WATER VALVE
	SIGN
	SANITARY SEWER MANHOLE
	GAS VALVE
	MONITORING WELL
	SOIL BORING_VPB-180
	CONTROL POINT



NOTES:

1. THE HORIZONTAL DATUM IS THE NEW YORK, LONG ISLAND STATE PLANE COORDINATE SYSTEM (NAD83) VERIFIED BY DIFFERENTIAL GPS OBSERVATIONS UTILIZING THE NGS CORS SYSTEM ON MARCH 18, 2021. REFERENCE STATIONS: NYBR, NYCI, NYRH AND RVDI
2. THE VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) GEOD12A, VERIFIED BY DIFFERENTIAL GPS OBSERVATIONS FROM THE NGS CORS SYSTEM ON DECEMBER 17, 2019. BENCHMARK REFERENCE STATIONS: NYBR (ORTHOMETRIC HEIGHT= 42.156'), NYCI (ORTHOMETRIC HEIGHT= 56.453'), NYVH (ORTHOMETRIC HEIGHT= 309.251') AND SHK6 (ORTHOMETRIC HEIGHT= 30.141').
3. THIS BASE MAP DEPICTS LIMITED PHYSICAL IMPROVEMENTS AS THEY EXISTED ON MARCH 18, 2021, IN THE AREA OF THE EXISTING GROUNDWATER MONITORING WELLS. NO ATTEMPT HAS BEEN MADE TO DETERMINE THE LOCATION OF PROPERTY LINES, EASEMENTS OR RIGHT-OF-WAY LINES.
4. ALL COORDINATES AND ELEVATIONS SHOWN HEREON ARE IN U.S. SURVEY FEET.
5. THE UTILITIES SHOWN HAVE BEEN LOCATED FROM EVIDENCE OBSERVED ON THE SURFACE ONLY. THE SURVEYOR MAKES NO GUARANTEES THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN-SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

DESCRIPTION	GROUND ELEVATION	OUTER CASING ELEVATION	INNER CASING ELEVATION	DATE SURVEYED
VPB-180	70.9	-	-	03/19/2021
MW-180D	71.2	71.15	70.75	03/19/2021
MW-180D1	71.3	71.30	70.96	03/19/2021
MW-180D2	71.0	71.04	70.67	03/19/2021

Coleridge Street

Taylor Avenue

E: 1124900
N: 200875

E: 1125000
N: 200875

**MONITORING WELL LOCATION MAP - VPB 180
FMR. NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
TAYLOR AVENUE AND COLERIDGE STREET
BETHPAGE, NASSAU COUNTY, NEW YORK**



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SCALE: 1"=20'
SHEET NO.: 1 OF 1
FIELD BOOK: 2021-1/45
JOB NO.: 191103
PROJECT NAME: 191103
DRAWING NO.: 191103_2021-05-11_WELLS
MAY 11, 2021 ORIGINAL ISSUE
ADDITIONS AND UPDATES

JOHN D. BEATTIE
NY PROFESSIONAL LAND SURVEYOR 050958-1

Date: MAY 11, 2021

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