Corrective Measures Work Plan
VCP Site #V00126

Location:

Unither Manufacturing LLC
755 Jefferson Road
Rochester, New York 14623

Prepared for:

Unither Manufacturing LLC
755 Jefferson Road
Rochester, New York 14623

LaBella Project No. 2172431

August 2020

LaBella
Powered by partnership.

300 State Street, Suite 201 | Rochester, NY 14614 | p 585-454-6110 | f 585-454-3066

CERTIFICATION

I, Ann Barber certify that I am currently a NYS registered professional engineer and that this Corrective Measures Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

100521	8/7/2020	Ann Barber
NYS Professional Engineer #	Date	Signature

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1.0 INTRODUCTION

LaBella Associates, D.P.C. (LaBella) is pleased to submit this Corrective Measures Work Plan (CMWP) to perform well rehabilitation/replacement, well installation, and additional investigation at 755 Jefferson Road, Town of Henrietta, Monroe County, New York, herein after referred to as the "Site." The Site was entered into the New York State Department of Environmental Conservation (NYSDEC) Voluntary Cleanup Program (VCP) in March 1998 as Site #V00126-8. LaBella is submitting this CMWP on behalf of Unither Manufacturing LLC ("Unither") to further investigate VOC detections in proximity to monitoring well MW-D7 in Building 3 at the Site. Unither acquired the property in 2013. The Scope of Work herein is designed to assess the potential presence of residual contamination associated with a methylene chloride release discovered in the 1990s.

1.1 Site Description

The Property is located in the Town of Henrietta, Monroe County, New York and is addressed as 755 Jefferson Road. The Property is an approximately 40-acre area bounded by Jefferson Road to the north, Strasenburgh Drive to the south, Clay Road to the east, and Marketplace Drive to the west. While the entire Property is approximately 40-acres in size, the Site as defined within the VCA is approximately 32-acres. Furthermore, the area of the Site subject to this CMWP is known as the Methylene Chloride Area (MCA) and is located within and immediately west of Building 3. Refer to Figure 1 for Site location.

The Site was developed in the 1950s for the manufacture of pharmaceuticals and has been owned by several pharmaceutical companies since 1958. Activities associated with the manufacture, research, and administration of pharmaceutical products has been conducted continuously at the Site since its construction through today. In 1996, Rhone-Poulenc-Rorer (RPR) purchased the Site from Fisons Pharmaceuticals. Later in 1996, RPR sold the Site to Medeva Pharmaceutical Manufacturing, Inc.

On March 31, 1998, Medeva Pharmaceuticals Manufacturing, Inc., which is now known as UCB Manufacturing, Inc., entered into a VCA with the NYSDEC to remediate two identified areas of concern within the estimate 32-acre VCA Site.

2.0 PREVIOUS INVESTIGATIONS & REMEDIATION

Historical information for the Site indicates a significant release of methylene chloride and other associated compounds occurred sometime before 1996, apparently from a former methylene chloride aboveground storage tank (AST) which was located immediately west of Building 3. The former AST was removed from the Site and replaced with interior ASTs in secondary containment. Significant contamination was noted in the area of nested monitoring wells MW-17/MW-D7 in the 1990s and 2000s. Wells MW-17/MW-D7 were installed in 2002, although MW-17 was decommissioned in 2003 due to damage sustained during the installation of angled well EXSB-1.

A Multi-Phase Recovery System (MPRS) was installed and operated at the Site from July 2006 until July 2010 to address the methylene chloride impacts. However, the 2010 Final Engineering Report (FER) indicated that significant impacts likely remain due to geological conditions at the Site. The remedial documentation indicates that the influence of the remedial system for both water drawdown and vacuum influence were minimal in the area of MW-17/MW-D7.

In October 2017, unexpected conditions were encountered as part of the annual groundwater monitoring event conducted by RocTerra, LLC ("RocTerra"), the consultant for the Volunteer under the VCP. When RocTerra initially opened the curbbox for MW-D7, the top of the well casing was reportedly found to be deformed and elevated headspace readings (up to 78 parts per million (ppm)) were measured. A groundwater sample collected from MW-D7 from the top of the water table identified elevated concentrations of methylene chloride (430,000-ug/L), acetone (1,800 ug/L) and chloromethane (20 ug/L). Acetone and chloromethane were historically identified at similar ratios to methylene chloride in groundwater from other, nearby wells prior to the remediation.

Following the October 2017 detections of methylene chloride, a well camera was utilized to observe the interior of the well and identified impairments/gaps between pieces of well casing at approximately 4.5-ft bgs, 14.5-ft bgs and 24.5-ft bgs. The static water level at that time was approximately 26-ft bgs and no impairments were observed below that level. The impairments/gaps are present where pieces of 10-ft long well casing are threaded together.

In an attempt to remove the methylene chloride impacted groundwater from the subsurface, purging of MW-D7 was completed in December 2017, February 2018 and March 2018. Samples collected from the top of the water column and the bottom of the well before and after purging events consistently showed higher VOC concentrations at the top of the water column. The sampling also showed an overall downward trend in VOC concentrations with each successive purging event, although VOC levels did rise between events, indicating additional contamination entering the well between purging events. The sample collected from the top of the water table following the final purging event in March 2018 detected methylene chloride at a concentration of 48,000-ug/L. However, analysis of a sample collected from MW-D7 in November 2018 identified concentrations of 480,000-ug/L of methylene chloride, 1,270-ug/L of acetone and 71-ug/L of chloromethane.

The 2017 and 2018 data indicates that methylene chloride concentrations are consistently significantly higher in MW-D7 at the top of the water column even after repeated purging of this well. Gaps/breaks in MW-D7 are noted at 4.5, 14.5, and 24.5-feet BGS and based on historical soil and groundwater data from this area, contaminated groundwater may be infiltrating via one or more of these gaps. The VOCs identified in the 2017 and 2018 data are the same VOCs at similar ratios to those identified in the 1990s/2000s; specifically, methylene chloride, acetone, carbon disulfide, chloroform, chloromethane and trans-1,2-dichloroethene.

3.0 SITE GEOLOGY AND HYDROGEOLOGY

The Site is located in the Erie-Ontario Lowlands Physiographic Province in western New York State. The Site occupies a nearly level, glacially influenced topographic surface. Bedrock observed during previous investigations in the MCA consists of green-gray shale at approximately 55-ft to 60-ft BGS. The shale bedrock is consistent with the mapped bedrock units for this part of the Upper Silurian Vernon Formation. Surficial deposits at the Site generally consist of reddish-brown silt and clay with less amounts of brown fine/coarse grained sand and gray, rounded gravel. The relative permeability of surficial deposits at the Site is considered low. As noted in the 2010 FER, the overburden geology at the Site results in areas of high void space which are poorly interconnected.

Overburden groundwater at the Site appears to be present in two (2) aquifers; a shallow/intermediate aquifer extending from a few feet below ground surface in some areas to approximately 30-ft to 40-ft bgs. The deep overburden aquifer appears present from approximately 30-ft to 40-ft bgs to the top of bedrock (i.e., 55-ft to 60-ft bgs).

4.0 STANDARDS, CRITERIA AND GUIDELINES

This section identifies the Standards, Criteria and Guidelines (SCGs) for the Site. The SCGs identified are used in order to quantify the extent of contamination at the Site that require remedial work based on the cleanup goal. The SCGs to be utilized as part of the implementation of this CMWP are identified below:

Soil SCGs: The following SCGs for soil were used in developing this RI Work Plan:

- NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (RPSCOs) for the Protection of Groundwater;
- NYCRR Subpart 375-6 RPSCOs for Unrestricted Use;
- NYCRR Subpart 375-6 RPSCOs for the Protection of Public Health/Commercial Use;

Groundwater SCGs: The following SCGs for groundwater were used in developing this CMWP:

- NYCRR Part 703 Groundwater Standards
- Technical and Operational Guidance Series (TOGS) 1.1.1 Water Quality Standards

5.0 INVESTIGATION SCOPE AND OBJECTIVES

Based on the previous environmental investigations as summarized in Section 2.1, elevated VOC concentrations observed in MW-D7, and the noted gaps/breaks in MW-D7, Unither entered into a Consent Order on June 22, 2020. As part of this Consent Order, Unither is responsible for developing a Corrective Measures Work Plan be completed for the following actions associated with the recent VOC detections in MW-D7:

1. Rehabilitation or replacement of MW-D7;
2. Installation of soil borings in the vicinity of MW-D7 to evaluate the potential presence of an additional source area; and,
3. Installation of a shallow monitoring well in the vicinity of former well MW-17.

5.1 MW-D7 Replacement

LaBella will retain a drilling subcontractor to decommission MW-D7 in accordance with the NYSDEC Commissioner Policy 43 (CP-43) guidance document. This would generally be completed by mobilizing a low-clearance drilling rig within Building 3 and over drilling the well to remove all well materials, then filling the borehole with grout in accordance with CP-43.

During the well decommissioning, LaBella personnel would be on-site for documentation purposes and to implement the CAMP as described in Section 5.5. Drilling water, soil, and well annulus materials (i.e. grout, sand, etc.) generated during this work will be containerized on-site in 55-gallon drums and subsequently characterized and properly disposed of off-site. Refer to Section 5.4 for additional details regarding waste disposal. Whenever possible, solid features of the well such as the curb box and PVC risers will be decontaminated and disposed of off-site as municipal solid waste.

MW-D7 will be replaced with a 2-inch diameter stainless steel well, screened at the same interval as the existing well. The well will be constructed with 0.010-slot well screen installed at 55-60-ft bgs, connected to an appropriate length of solid well riser to complete the well. The annulus will be sand

packed with quartz sand to a nominal depth of 2-ft above the screen section. The remaining annulus will be bentonite-sealed to the ground surface.

The replacement well will be developed and sampled in accordance with Section 5.3. The replacement well will be designated "MW-D7R".

5.2 Boring Installation and Soil Sampling

This portion of the investigation is designed to evaluate the top 20-ft to 30-ft of the subsurface in the vicinity of MW-D7. Proposed investigation locations are depicted on attached Figure 2.

Prior to mobilization to the Site, a *Dig Safely New York* stakeout will be conducted at the Site to locate subsurface utilities in the areas where the subsurface investigation will take place. LaBella will obtain any relevant utility drawings and/or other information regarding underground utilities from the owner prior to implementation of subsurface work at the Site.

A direct push soil boring study will be implemented at the Site for the advancement of six (6) soil borings. Each soil boring will be advanced to depths between 20-ft and 30-ft BGS, pending field readings, refusal depths, and at the discretion of the project geologist or engineer. Three (3) borings are anticipated to be advanced within Building 3 while three (3) borings are anticipated to be advanced immediately west of Building 3, as depicted on Figure 2. Interior borings will be completed by first coring the concrete floor slab with an approximately 6-inch (in) diameter core bit prior to advancing drilling equipment. Following completion of interior borings, the floor slab will be restored using grout or, if a monitoring well is installed, using a flush-mounted curb box.

Soils from the boring will be continuously assessed for visible or olfactory indications of impairment, and/or indication of detectable VOCs with a photo ionization detector (PID) capable of measuring VOCs in the parts per billion (PPB) range. Positive indications from any of these screening methods are collectively referred to as "evidence of impairment." Continuous soil sampling will be conducted and it is currently anticipated that up to six (6) soil samples will be selected for laboratory analysis. Samples will be collected from the locations exhibiting the greatest PID readings. Soil samples will be delivered under standard chain of custody procedures to a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) certified laboratory for analysis of the following:

- United States Environmental Protection Agency (USEPA) Target Compound List (TCL) and New York State Department of Environmental Conservation (NYSDEC) Commissioner Policy 51 (CP-51) VOCs using USEPA Method 8260.

Soil samples will be collected using USEPA Method 5035. One (1) blind duplicate, matrix spike and matrix spike duplicate (MS/MSD) sample will be collected for the same parameters. Exploration locations will be located with a global positioning system or tape measured from existing site features.

5.3 Monitoring Well Installation and Groundwater Sampling

Upon installation of the soil borings detailed in Section 5.2, three (3) shallow overburden groundwater monitoring wells are planned to be installed within selected boreholes. One (1) of these wells will include the MW-17 replacement well requested in the NYSDEC's letter. In addition to these three (3) shallow wells, the replacement well for MW-D7 (refer to Section 5.1) will also be developed and sampled as detailed in this section.

Each well will be 2-in in diameter. Wells are anticipated to be constructed of stainless steel materials to prevent future impairment of the well due to potential residual levels of contamination. If additional wells are deemed necessary further from MW-D7 during the fieldwork these wells may be completed with PVC materials rather than stainless steel, pending field readings.

Each well will be completed with 10-ft of 0.010-slot well screen connected to an appropriate length of solid well riser to complete the well. Each annulus will be sand packed with quartz sand to a nominal depth of 2-ft above the screen section. The remaining annulus will be bentonite-sealed to the ground surface. The MW-17 replacement well will be screened at the same depth interval as the original well; 6-16-ft bgs.

Although previously decommissioned, angled well EXSB-1 traverses the investigation area at some point below the MW-17 curbbox. Impact to the former EXSB-1 casing will be avoided by drilling replacement well MW-17R just north of the former MW-17. Refer to attached Figure 2 for the approximate location of EXSB-1.

At least 48-hours following installation, each new well will be developed using a submersible pump or disposable bailer. Development will consist of the removal of five (5) well volumes from each well. Development water will be containerized in drums for future off-site disposal. At least 1-week after development, groundwater sampling of the seven (7) new wells and replacement well MW-D7 will commence using the following methods. Wells will be sampled using low-flow techniques (i.e. bladder pump):

a. Prior to sampling and immediately following removal of the cap on each well casing, headspace readings will be measured in each well using a PID.
b. Water quality parameters including turbidity, pH, temperature, specific conductivity, dissolved oxygen, oxidation reduction potential, and depth to water will be recorded at five (5) minute intervals. Samples will be collected when the parameters have stabilized for three (3) consecutive 5-minute intervals to within the specified ranges below:
    - Water level drawdown (<0.3')
    - Turbidity (+/- 10%, < 50 NTU for metals)
    - pH (+/- 0.1)
    - Temperature (+/- 3%)
    - Specific conductivity (+/- 3%)
    - Dissolved oxygen (+/- 10%)
    - Oxidation reduction potential (+/- 10 millivolts)
c. The pump intake will be set in the middle of the well screen (anticipated to be 5-ft above the bottom of each well) for the newly installed wells. Samples collected from MW-D7R will be collected from the top of the water column (anticipated to be approximately 26-ft BGS) and the middle of the well screen (approximately 57.5-ft BGS).

Groundwater samples will be delivered under standard chain of custody procedures to a NYSDOH ELAP certified laboratory for analysis of the following:

- USEPA TCL and NYSDEC CP-51 VOCs using USEPA Method 8260.

A blind duplicate, MS/MSD, and trip blank will be collected and analyzed for the same parameters. It should be noted that routine groundwater monitoring as required per the SMP will be conducted as planned by the VCP Volunteer, separately from this CMWP.

5.4 Investigation-Derived Waste

Soil cuttings, development water and purge water will be containerized on-site in 55-gallon drums (or similar) for subsequent characterization and off-site disposal. Decommissioned well materials and concrete cores will be disposed of as municipal solid waste.

5.5 CAMP Monitoring

As required by the 2011 Site Management Plan (SMP), the Site-specific Community Air Monitoring Plan (CAMP) will be implemented during subsurface work (i.e. drilling) completed as part of this work. Although the Site-specific CAMP within the SMP calls for three (3) CAMP stations, LaBella assumes that only two (2) CAMP stations, each with a particulate monitoring and PID will be required due to the nature of the work (i.e., discrete drilling locations rather than excavation).

5.6 Health and Safety

LaBella's Health and Safety Plan (HASP) for this project is included as Appendix 1. An addendum to the HASP outlines additional health and safety precautions and procedures to be implemented during this project associated with the COVID-19 virus. The guidelines and procedures detailed in this addendum are intended to minimize COVID-19 health risks for LaBella employees and related contractors, Unither staff and the general public during the project. This HASP addendum is also included in Appendix 1.

5.8 Quality Assurance/Quality Control Plan

Activities completed at the Site will be managed under LaBella's Quality Control Program (QCP) included as Appendix 2. Laboratory QA/QC sampling will include analysis of one (1) duplicate and one (1) MS/MSD for each matrix type (i.e., soil and groundwater) at a rate of one per 20 samples collected for each parameter group, or one per shipment, whichever is greater. The samples will be delivered under Chain of Custody procedures to an ELAP-certified laboratory. The laboratory will provide a NYSDEC ASP Category B Deliverables data package. A DUSR will be completed for all ASP-B laboratory data packages per DER-10.

6.0 CMWP SCHEDULE & REPORTING

At the conclusion of the investigation, a report will be prepared summarizing the investigation conducted at the Site, including a comparison of all site-specific analytical data to the appropriate NYSDEC Guidance Values. The report will also contain mapping that depicts all investigative points, site features and areas of impacted soil and/or groundwater at the Site.

Implementation of the CMWP will begin within 30 days after NYSDEC approval of this work plan. An investigation report will be submitted within two (2) months of receipt of validated data.

FIGURES

755 JEFFERSON ROAD

Legend

Site

PROJECT/DRAWING NUMBER: **2172431** **FIGURE 1**	PROJECT: **755 Jefferson Road Henrietta, New York** DRAWING NAME: **SITE LOCATION**	CLIENT: **UNITHER MANUFACTURING LLC**

N W E S

0 1,000 2,000 Feet

1 inch = 2,000 feet

INTENDED TO PRINT AS: 11" X 17"

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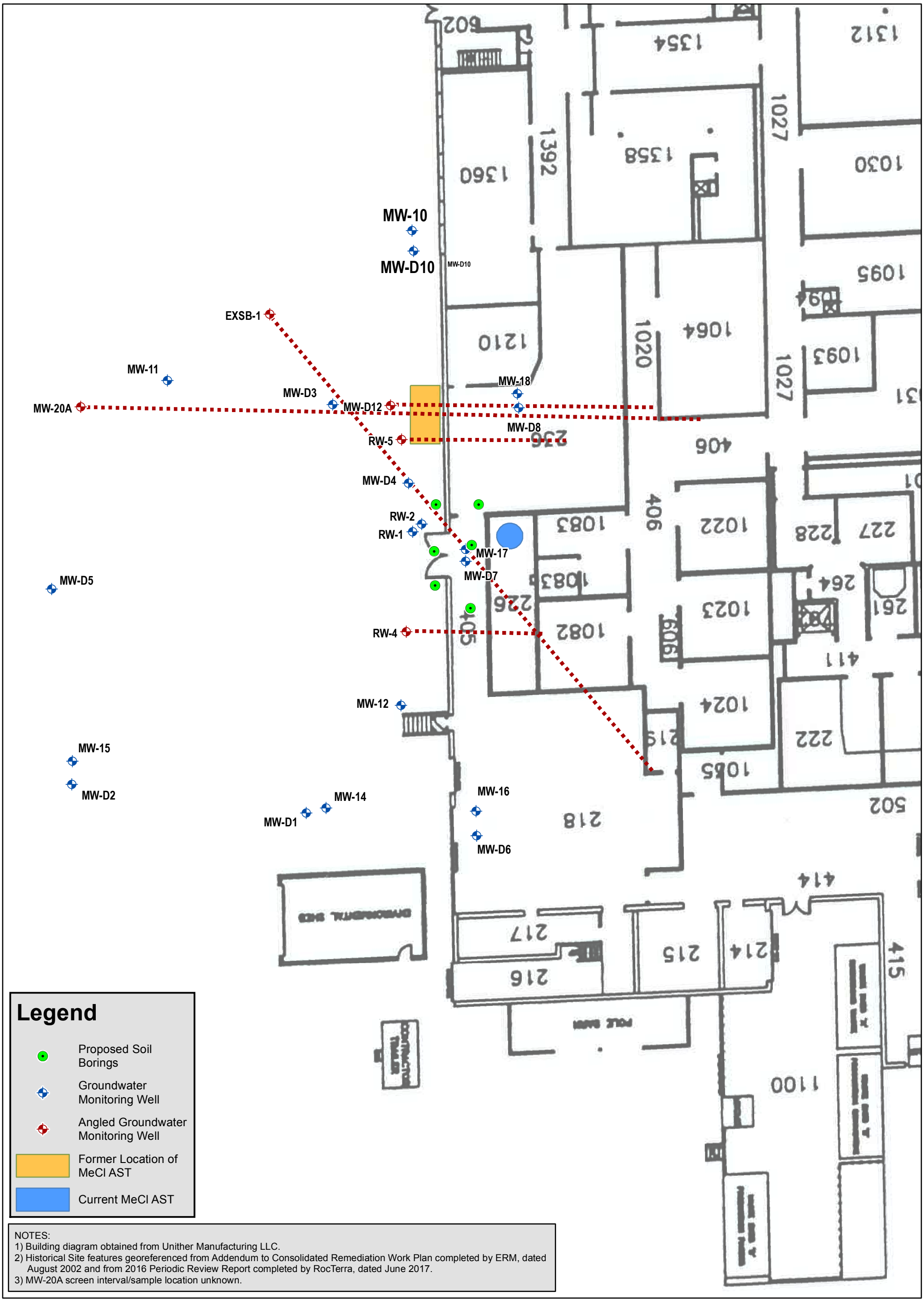

NOTES:
1) Building diagram obtained from Unither Manufacturing LLC.
2) Historical Site features georeferenced from Addendum to Consolidated Remediation Work Plan completed by ERM, dated August 2002 and from 2016 Periodic Review Report completed by RocTerra, dated June 2017.
3) MW-20A screen interval/sample location unknown.

PROJECT/DRAWING NUMBER:
2172431
FIGURE 2

PROJECT:
755 Jefferson Road
Henrietta, New York

DRAWING NAME:
PROPOSED INVESTIGATION

CLIENT:
UNITHER MANUFACTURING LLC

N W E S

0 10 20 Feet

1 inch = 20 feet

INTENDED TO PRINT AS: 11" X 17"

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APPENDIX 1

Health and Safety Plan

Site Health and Safety Plan

Location:

Unither Manufacturing LLC
755 Jefferson Road
Rochester, New York 14623

LaBella Project No. 2172431

September 2019

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SITE HEALTH AND SAFETY PLAN

Project Title:	755 Jefferson Road – Corrective Measures Work Plan
Project Number:	2172431
Project Location (Site):	755 Jefferson Road, Rochester, New York 14623
Project Manager:	Jennifer Gillen, LaBella Associates, DPC
Site Safety Supervisor:	To Be Determined
Site Contact:	Mr. Christian Hargis, Unither Manufacturing LLC
Safety Director:	David Engert, LaBella Associates, DPC
Proposed Date(s) of Field Activities:	To Be Determined
Site Conditions:	40 acres; Residual contamination remains on-site from a documented release of methylene chloride and other associated compounds sometime before 1996.
Site Environmental Information Provided By:	*Site Management Plan*, completed by Kleinfelder Engineering, P.C. ("Kleinfelder"), August 2011
Air Monitoring Provided By:	LaBella Associates, DPC
Site Control Provided By:	LaBella Associates, DPC

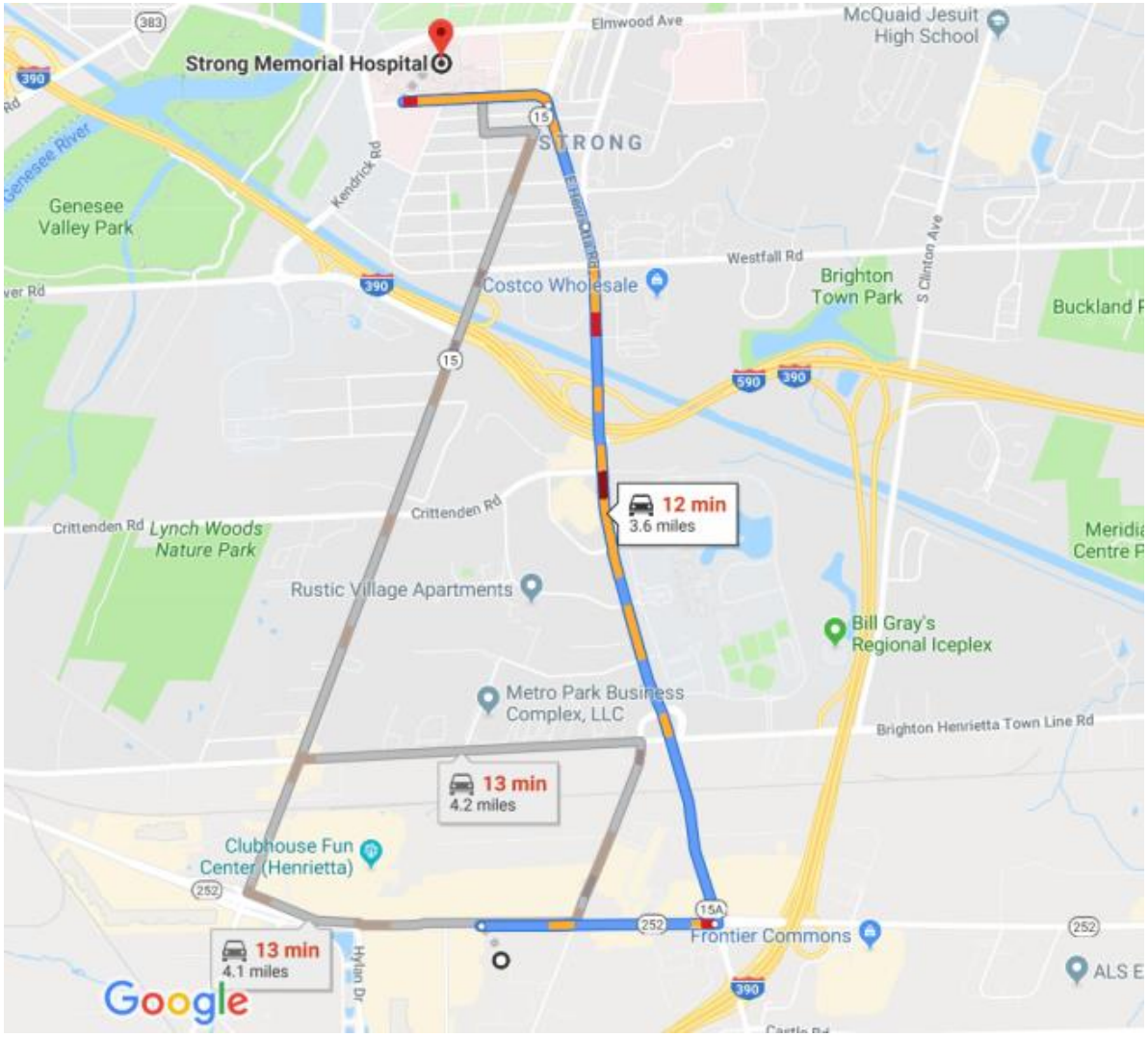
EMERGENCY CONTACTS

	Name	Phone Number
Ambulance:	As Per Emergency Service	911
Hospital Emergency:	Strong Memorial Hospital	(585) 275-2100
Poison Control Center:	Upstate Poison Control Center	1-800-222-1222
Police (local, state):	Monroe County Sheriff	911
Fire Department:	Henrietta Fire District	911
Site Contact:	Christian Hargis	585-259-9552
Agency Contact:	NYSDEC	585-226-5428
Project Manager:	Jennifer Gillen	585-295-6648
Site Safety Supervisor:	To Be Determined	To Be Determined
Safety Director	David Engert	585-295-6630

MAP AND DIRECTIONS TO THE MEDICAL FACILITY - STRONG MEMORIAL HOSPITAL

Total Est. Time: 12 minutes **Total Est. Distance:** 3.6 miles

1:	Head EAST on NY-252E toward CLAY RD	0.7 miles
2:	Use the left 2 lanes to turn LEFT onto NY-15A N/E HENRIETTA RD	2.1 miles
3:	Keep LEFT to continue on E HENRIETTA RD	0.4 miles
4:	SLIGHT LEFT onto CRITTENDEN BLVD	0.4 miles
5:	End at **Strong Memorial Hospital** Rochester, NY 14642	



1.0 Introduction

The purpose of this Health and Safety Plan (HASP) it to provide guidelines for responding to potential health and safety issues that may be encountered during ground ground intrusive activities at 755 Jefferson Road in the Town of Henrietta, Monroe County, New York (the Site). This HASP only reflects the policies of LaBella Associates D.P.C. The requirements of this HASP are applicable to LaBella personnel at the work site. It is the responsibility of each sub-consultant and sub-contractor to follow their own company HASP. This document's project specifications should be consulted for guidance in preventing and quickly abating any threat to human safety or the environment. The provisions of the HASP were developed in general accordance with 29 CFR 1910 and 29 CFR 1926 and do not replace or supersede any regulatory requirements of the USEPA, NYSDEC, OSHA or and other regulatory body.

2.0 Responsibilities

This HASP presents guidelines to minimize the risk of injury to project personnel, and to provide rapid response in the event of injury. The HASP is applicable only to activities of approved LaBella personnel. It is the responsibility of LaBella employees to follow the requirements of this HASP, or HASPs specific to individual activities, and all applicable company safety procedures.

3.0 Activities Covered

The activities covered under this HASP are limited to the following:

- Environmental Monitoring associated with intrusive activities at the Site including but not limited to:
  - Geoprobing
  - Well Decommissioning
- Soil, Surface Water, and Groundwater Characterization

4.0 Work Area Access and Site Control

Site control during the project will be the responsibility of LaBella. LaBella will have primary responsibility for maintaining a safe work area for all activities conducted by LaBella personnel. Such work area controls will consist of:

- Temporary fencing.
- Air monitoring.
- Use of Personal Protective Equipment (PPE).

5.0 Potential Health and Safety Hazards

This section lists some potential health and safety hazards that project personnel may encounter at the project site and some actions to be implemented by approved personnel to control and reduce the associated risk to health and safety. This is not intended to be a complete listing of any and all potential health and safety hazards. New or different hazards may be encountered as site environmental and site work conditions change. The suggested actions to be taken under this plan are not to be substituted for good judgment on the part of project personnel. At all times, the Site Safety Officer has responsibility for site safety and his instructions must be followed.

5.1 Hazards Due to Heavy Machinery and Equipment

Potential Hazard:
Heavy machinery including trucks, drilling rigs, trailers, etc. will be in operation at the site. The presence of such equipment presents the danger of being struck or crushed. Use caution when working near heavy machinery.

Protective Action:
Make sure that operators are aware of your activities, and heed operator's instructions and warnings. Wear bright colored clothing and walk safe distances from heavy equipment. A hard hat, safety glasses and steel toe shoes are required.

5.2 Excavation Hazards

Potential Hazard:
Excavations and trenches can collapse, causing injury or death. Edges of excavations can be unstable and collapse. Toxic and asphyxiant gases can accumulate in confined spaces and trenches. Excavations that require working within the excavation will require air monitoring in the breathing zone (refer to Section 9.0).

Excavations left open create a fall hazard which can cause injury or death.

Protective Action:
Personnel must receive approval from the Project Manager to enter an excavation for any reason. Subsequently, approved personnel are to receive authorization for entry from the Site Safety Officer. Approved personnel are not to enter excavations over 4 feet in depth unless excavations are adequately sloped. Additional personal protective equipment may be required based on the air monitoring.

Personnel should exercise caution near all excavations at the site as it is expected that excavation sidewalls will be unstable. Do not proceed closer than 3 feet to an unsupported or non-sloped excavation side wall.

Fencing and/or barriers accompanied by "no trespassing" signs should be placed around all excavations when left open for any period of time when work is not being conducted.

5.3 Cuts, Punctures and Other Injuries

Potential Hazard:
In any excavation or construction work site there is the potential for the presence of sharp or jagged edges on rock, metal materials, and other sharp objects. Serious cuts and punctures can result in loss of blood and infection.

Protective Action:
The Project Manager is responsible for making First Aid supplies available at the work site to treat minor injuries. The Site Safety Officer is responsible for arranging the transportation of authorized on-site personnel to medical facilities when First Aid treatment in not sufficient. Do not move seriously injured workers. All injuries requiring treatment are to be reported to the Project Manager. Serious injuries are to be reported immediately to the Site Safety Officer.

5.4 Injury Due to Exposure of Chemical Hazards

Potential Hazards:
Contaminants identified in testing locations at the Site include various volatile organic compounds (VOCs), primarily VOCs associated with Site contamination. Volatile organic vapors, chlorinated solvents or other chemicals may be encountered during subsurface activities at the project work site. Inhalation of high concentrations of volatile organic vapors can cause headache, stupor, drowsiness, confusion and other health effects. Skin contact can cause irritation, chemical burn, or dermatitis. The Safety Data Sheet is included as Appendix 1 of the IRM Work Plan.

Protective Action:
The presence of organic vapors may be detected by their odor and by monitoring instrumentation. Approved employees will not work in environments where hazardous concentrations of organic vapors are present. Air monitoring will be performed in accordance with the NYSDOH Generic CAMP. Personnel are to leave the work area whenever PID measurements of ambient air exceed 25 ppm consistently for a 5 minute period. In the event that sustained total volatile organic compound (VOC) readings of 25 ppm is encountered personnel should upgrade personal protective equipment to Level C (refer to Section 8.0) and an Exclusion Zone should be established around the work area to limit and monitor access to this area (refer to Section 6.0).

5.5 Injuries Due to Extreme Hot or Cold Weather Conditions

Potential Hazards:
Extreme hot weather conditions can cause heat exhaustion, heat stress and heat stroke or extreme cold weather conditions can cause hypothermia.

Protective Action:
Precaution measures should be taken such as dress appropriately for the weather conditions and drink plenty of fluid. If personnel should suffer from any of the above conditions, proper techniques should be taken to cool down or heat up the body and taken to the nearest hospital if needed.

6.0 Work Zones

In the event that conditions warrant establishing various work zones (i.e., based on hazards - Section 5.4), the following work zones should be established:

Exclusion Zone (EZ):
The EZ will be established in the immediate vicinity and adjacent downwind direction of site activities that elevate breathing zone VOC concentrations to unacceptable levels based on field screening. These site activities include contaminated soil excavation and soil sampling activities. If access to the site is required to accommodate non-project related personnel then an EZ will be established by constructing a barrier around the work area (yellow caution tape and/or construction fencing). The EZ barrier shall encompass the work area and any equipment staging/soil staging areas necessary to perform the associated work. The contractor(s) will be responsible for establishing the EZ and limiting access to approved personnel. LaBella will not enter the EZ unless deemed necessary to do so. Depending on the condition for establishing the EZ, access to the EZ may require adequate PPE (e.g., Level C).

Contaminant Reduction Zone (CRZ):
The CRZ will be the area where personnel entering the EZ will don proper PPE prior to entering the EZ and the area where PPE may be removed. The CRZ will also be the area where decontamination of equipment and personnel will be conducted as necessary.

7.0 Decontamination Procedures

Upon leaving the work area, approved personnel shall decontaminate footwear as needed. Under normal work conditions, detailed personal decontamination procedures will not be necessary. Work clothing may become contaminated in the event of an unexpected splash or spill or contact with a contaminated substance. Minor splashes on clothing and footwear can be rinsed with clean water. Heavily contaminated clothing should be removed if it cannot be rinsed with water. Personnel assigned to this project should be prepared with a change of clothing whenever on site.

8.0 Personal Protective Equipment

Generally, site conditions at this work site require level of protection of Level D or modified Level D. However, air monitoring will be conducted to determine if up-grading to Level C PPE is required (refer to Section 9.0). Descriptions of the typical safety equipment associated with Level D and Level C are provided below:

Level D:
Hard hat, safety glasses, rubber nitrile sampling gloves, steel toe construction grade boots, etc.

Level C:
Level C PPE and full or ½-face respirator and tyvek suit (if necessary). [*Note: Organic vapor cartridges are to be changed after each 8-hours of use or more frequently.*]

9.0 Air Monitoring

According to 29 CFR 1910.120(h), air monitoring shall be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection required for personnel working onsite. Air monitoring will consist at a minimum of the procedure listed below. Air monitoring instruments will be calibrated and maintained in accordance with the manufacturer's specifications.

The Air Monitor will utilize a photoionization detector (PID) to screen the ambient air in the work areas (drilling, excavation, soil staging, and soil grading areas) for total Volatile Organic Compounds (VOCs) and a DustTrak tm Model 8520 aerosol monitor or equivalent for measuring particulates. Work area ambient air will generally be monitored in the work area and downwind of the work area. Air monitoring of the work areas and downwind of the work areas will be performed at least every 60 minutes using a PID and the DustTrak meter.

If sustained PID readings of greater than 25 ppm are recorded in the breathing zone, either personnel are to leave the work area until satisfactory readings are obtained or approved personnel may re-enter the work areas wearing at a minimum a ½ face respirator with organic vapor cartridges for an 8-hour duration (i.e., upgrade to Level C PPE). Organic vapor cartridges are to be changed after each 8-hour use or more frequently, if necessary. If PID readings are sustained, in the work

area, at levels above 50 ppm for a 5 minute average, work will be stopped immediately until safe levels of VOCs are encountered or additional PPE will be required (i.e., Level B).

If downwind PID measurements reach or exceed 25 ppm consistently for a 5 minute period downwind of the work area, PID readings will be taken within the buildings (if occupied) on Site to ensure that the vapors are not penetrating any occupied building and effecting the personnel working within. If the PID measurements reach or exceed 25 ppm within the nearby buildings, the personnel should be evacuated via a route in which they would not encounter the work area. The building should then be ventilated until the PID measurements within the building are at or below background levels. It should be noted that the site buildings are currently vacant.

10.0 Emergency Action Plan

In the event of an emergency, employees are to turn off and shut down all powered equipment and leave the work areas immediately. Employees are to walk or drive out of the Site as quickly as possible and wait at the assigned 'safe area'. Follow the instructions of the Site Safety Officer.

Employees are not authorized or trained to provide rescue and medical efforts. Rescue and medical efforts will be provided by local authorities.

11.0 Medical Surveillance

Medical surveillance will be provided to all employees who are injured due to overexposure from an emergency incident involving hazardous substances at this site.

12.0 Employee Training

Personnel who are not familiar with this site plan will receive training on its entire content and organization before working at the Site.

Individuals involved with the fieldwork must be 40-hour OSHA HAZWOPER trained with current 8-hour refresher certification.

Table 1
Exposure Limits and Recognition Qualities

Compound	PEL-TWA (ppm)(b)(d)	TLV-TWA (ppm)(c)(d)	STEL	LEL (%)(e)	UEL (%)(f)	IDLH (ppm)(g)(d)	Odor	Odor Threshold (ppm)	Ionization Potential
Acetone	750	500	NA	2.15	13.2	20,000	Sweet	4.58	9.69
Anthracene	0.2	0.2	NA	NA	NA	NA	Faint aromatic	NA	NA
Benzene	1	0.5	5	1.3	7.9	3000	Pleasant	8.65	9.24
Benzo (a) pyrene (coal tar pitch volatiles)	0.2	0.1	NA	NA	NA	700	NA	NA	NA
Benzo (a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (b) Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (k) Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	10.88
Carbon Disulfide	20	1	NA	1.3	50	500	Odorless or strong garlic type	0.096	10.07
Chlorobenzene	75	10	NA	1.3	9.6	2,400	Faint almond	0.741	9.07
Chloroform	50	2	NA	NA	NA	1,000	ethereal odor	11.7	11.42
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethylene	200	200	NA	9.7	12.8	400	Acrid	NA	9.65
1,2-Dichlorobenzene	50	25	NA	2.2	9.2		Pleasant		9.07
Ethylbenzene	100	100	NA	1	6.7	2,000	Ether	2.3	8.76
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	NA	NA	NA	5	15	NA	NA	NA	12.98
Methylene Chloride	500	50	NA	12	23	5,000	Chloroform-like	10.2	11.35
Naphthalene	10, Skin	10	NA	0.9	5.9	250	Moth Balls	0.3	8.12
n-propylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethane	NA	NA	NA	NA	NA	NA	Sweet	NA	NA
Toluene	100	100	NA	0.9	9.5	2,000	Sweet	2.1	8.82
Trichloroethylene	100	50	NA	8	12.5	1,000	Chloroform	1.36	9.45
1,2,4-Trimethylbenzene	NA	25	NA	0.9	6.4	NA	Distinct	2.4	NA
1,3,5-Trimethylbenzene	NA	25	NA	NA	NA	NA	Distinct	2.4	NA
Vinyl Chloride	1	1	NA	NA	NA	NA	NA	NA	NA
Xylenes (o,m,p)	100	100	NA	1	7	1,000	Sweet	1.1	8.56
Metals									
Arsenic	0.01	0.2	NA	NA	NA	100, Ca	Almond	NA	NA
Cadmium	0.2	0.5	NA	NA	NA	NA	NA	NA	NA
Chromium	1	0.5	NA	NA	NA	NA	NA	NA	NA
Lead	0.05	0.15	NA	NA	NA	700	NA	NA	NA
Mercury	0.05	0.05	NA	NA	NA	28	Odorless	NA	NA
Selenium	0.2	0.02	NA	NA	NA	Unknown	NA	NA	NA
Other									
Asbestos	0.1 (f/cc)	NA	1.0 (f/cc)	NA	NA	NA	NA	NA	NA

(a) Skin = Skin Absorption

(b) OSHA-PEL Permissible Exposure Limit (flame weighted average, 8-hour): NIOSH Guide, June 1990

(c) ACGIH – 8 hour time weighted average from Threshold Limit Values and Biological Exposure Indices for 2003

(d) Metal compounds in mg/m3

(e) Lower Exposure Limit (%)

(f) Upper Exposure Limit (%)

(g) mmediately Dangerous to Life or Health Level: NIOSH Guide, June 1990

Notes:

1. All values are given in parts per million (PPM) unless otherwise indicated
2. Ca = Possible Human Carcinogen, no IDLH information

SAFETY DATA SHEET

M47008 - ANSI - EN

METHYLENE CHLORIDE

SDS No.: M47008 **SDS Revision Date:** 24-Jul-2019

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 14555 Dallas Parkway, Suite 400 P.O. Box 809050 Dallas, TX 75254
24 Hour Emergency Telephone Number:	1-800-733-3665 or 1-972-404-3228 (USA); CANUTEC (Canada): 1-613-996-6666; CHEMTREC (within USA and Canada): 1-800-424-9300; CHEMTREC (outside USA and Canada): +1 703-527-3887; CHEMTREC Contract No: CCN16186
To Request an SDS:	MSDS@oxy.com or 1-972-404-3245
Customer Service:	1-800-752-5151 or 1-972-404-3700
Product Identifier:	**METHYLENE CHLORIDE**
Trade Name:	Methylene Chloride, Technical Grade; Methylene Chloride, Decaffeination Grade; Methylene Chloride Amyl Food Grade
Synonyms:	Dichloromethane; Methylene Dichloride
Product Use:	Methylene Chloride is used in washing & cleaning products, coating products, adhesives and sealants and extraction agents. This substance has an industrial use resulting in manufacture of another substance (use of intermediates). Paint stripping applications may be limited. See "Uses Advised Against" below
Uses Advised Against:	NOT FOR USE IN BATHTUB STRIPPING APPLICATIONS. NOT FOR USE IN RESIDENTIAL HOME OR WORKSHOP AREAS. NOT FOR ANY COMMERCIAL APPLICATIONS TAKING PLACE IN RESIDENTIAL SETTINGS. NOT FOR USE

IN COMMERCIAL/INDUSTRIAL APPLICATIONS NOT PROPERLY VENTILATED OR NOT DESIGNED TO ACCOMMODATE THE SAFE USE OF THIS CHEMICAL*.

*NOTE: ALL COMMERCIAL/INDUSTRIAL USES OF METHYLENE CHLORIDE, INCLUDING PAINT AND COATING REMOVAL, SHOULD COMPLY WITH ALL RISK MANAGEMENT MEASURES FOUND IN 29CFR 1910.1052, OSHA'S METHYLENE CHLORIDE REGULATIONS (REGARDLESS OF EMPLOYER SIZE).

Restrictions on Use (United States): This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

Other Global Restrictions on Use: Methylene Chloride may be restricted and/or prohibited for use in cosmetic products. See local, regional, and/or national regulations specific to cosmetic regulations. See local, regional, or national regulations for Maximum Residue Levels (MRLs) when the food grade product is used as a food extraction solvent, if applicable. Other restrictions on use based on local, regional, or national regulations may exist and must be determined on a case-by-case basis.

Chemical Family: Saturated aliphatic halogenated solvent

Note: The Special, Aerosol, and Degreasing Grades contain small amounts of a propylene oxide stabilizer. The Technical, Decaffeination, and Amyl Food Grades do not.

SECTION 2. HAZARDS IDENTIFICATION

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

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EMERGENCY OVERVIEW:

Color: Colorless
Physical State: Liquid
Appearance: Clear
Odor: Mildly sweet odor, Chloroform-like odor

Signal Word: **DANGER**

MAJOR HEALTH HAZARDS: HARMFUL IF SWALLOWED. MAY BE HARMFUL IF SWALLOWED AND ENTERS AIRWAYS. CAUSES SKIN IRRITATION. CAUSES SERIOUS EYE IRRITATION. MAY CAUSE RESPIRATORY IRRITATION. MAY CAUSE DROWSINESS OR DIZZINESS. CAUSES DAMAGE TO CARDIOVASCULAR SYSTEM

METHYLENE CHLORIDE

INCLUDING ELEVATED CARBOXYHEMOGLOBIN LEVELS. MAY CAUSE DAMAGE TO BLOOD AND LIVER THROUGH PROLONGED OR REPEATED EXPOSURES. SUSPECTED OF CAUSING CANCER.

AQUATIC TOXICITY: HARMFUL TO AQUATIC LIFE.

PRECAUTIONARY STATEMENTS: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe mist, vapors, or spray. Wash skin and contaminated clothing thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves, protective clothing, eye, and face protection. Avoid release to the environment. Store in a well-ventilated place. Keep container tightly closed. Store in a secure manner. Material that cannot be reused or chemically reprocessed should be disposed of in accordance with all applicable federal, state and local health and environmental regulations.

ADDITIONAL HAZARD INFORMATION: Exposure in an enclosed or poorly-ventilated area may be very harmful. Methylene chloride can be metabolized to carbon monoxide (CO), which is then very tightly bound to hemoglobin. This complex is called carboxyhemoglobin (COHb) and results in a reduction in the oxygen carrying capacity of the blood. This product may be absorbed through the skin, causing systemic effects.

****

HAZARD CLASSIFICATION:

GHS: CONTACT HAZARD - SKIN:	Category 2 - Causes skin irritation
GHS: CONTACT HAZARD - EYE:	Category 2A - Causes serious eye irritation
GHS: ACUTE TOXICITY - ORAL:	Category 4 - Harmful if swallowed
GHS: TARGET ORGAN TOXICITY (SINGLE EXPOSURE):	Category 1 - Causes damage to cardiovascular system including elevated carboxyhemoglobin levels Category 3 - May cause drowsiness or dizziness Category 3 - May cause respiratory tract irritation
GHS: TARGET ORGAN TOXICITY (REPEATED EXPOSURE):	Category 2 - May cause damage to Blood and Hepatic System through prolonged or repeated exposures
GHS: CARCINOGENICITY:	Category 2 - Suspected of causing cancer
HAZARDS NOT OTHERWISE CLASSIFIED (HNOC):	• ASPIRATION HAZARD - CATEGORY 2: May be harmful if swallowed and enters airways • ACUTE AQUATIC HAZARD - CATEGORY 3: Harmful to aquatic life

GHS SYMBOL: Exclamation mark, Health hazard

GHS SIGNAL WORD: **DANGER**

GHS HAZARD STATEMENTS:

GHS - Health Hazard Statement(s)
• Harmful if swallowed
• Causes skin irritation
• Causes serious eye irritation
• May cause respiratory irritation
• May cause drowsiness or dizziness
• Suspected of causing cancer
• May cause damage to blood and hepatic system through prolonged or repeated exposure
• Causes damage to cardiovascular system including elevated carboxyhemoglobin levels

Additional Hazards - GHS Hazards Not Otherwise Classified (HNOC):
• ASPIRATION HAZARD - CATEGORY 2: May be harmful if swallowed and enters airways
• ACUTE AQUATIC HAZARD - CATEGORY 3: Harmful to aquatic life

GHS - Precautionary Statement(s) - Prevention
• Obtain special instructions before use
• Do not handle until all safety precautions have been read and understood
• Do not breathe mist, vapors, or spray
• Wash skin and contaminated clothing thoroughly after handling
• Do not eat, drink or smoke when using this product
• Use only outdoors or in a well-ventilated area
• Wear eye protection, face protection, protective gloves, protective clothing

GHS - Precautionary Statement(s) - Response
• IF SWALLOWED: Immediately call a POISON CENTER OR LICENSED HEALTH CARE PROVIDER
• Rinse mouth
• Do NOT induce vomiting
• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
• If eye irritation persists: Get medical advice/attention
• IF ON SKIN: Wash with plenty of soap and water
• If skin irritation occurs: Get medical advice/attention
• Take off contaminated clothing and wash it before reuse
• IF exposed or concerned: Get medical advice/attention
• IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing
• IF INHALED: Call a POISON CENTER OR LICENSED HEALTH CARE PROVIDER if you feel unwell
• Get medical advice/attention if you feel unwell

GHS - Precautionary Statement(s) - Storage
• Store in a well-ventilated place. Keep container tightly closed
• Store in a secure manner

GHS - Precautionary Statement(s) - Disposal
• Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations

Physical Hazards Not Otherwise Classified
• Not Classified

Hazard Not Otherwise Classified (HNOC)-Health

• Methylene chloride can be metabolized to carbon monoxide (CO), which is then very tightly bound to hemoglobin. This complex is called carboxyhemoglobin (COHb) and results in a reduction in the oxygen carrying capacity of the blood. This product may be absorbed through the skin, causing systemic effects
• Exposure in an enclosed or poorly-ventilated area may be very harmful
• This material may be absorbed across the skin causing systemic effects
• ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE

See Section 11: TOXICOLOGICAL INFORMATION

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	Percent [%]
Methylene chloride (Dichloromethane)	75-09-2	100

SECTION 4. FIRST AID MEASURES

INHALATION: If inhalation of this material occurs and adverse effects result, move person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician. See Notes to Physician below and Section 11 for more information.

SKIN CONTACT: If on skin, wash with plenty of water. If skin irritation occurs, get medical advice/attention. Take off contaminated clothing and wash before reuse. Treat any skin irritation symptomatically.

EYE CONTACT: If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical attention.

INGESTION: If swallowed, rinse mouth. Do NOT induce vomiting. Contact a poison center or doctor/physician if you feel unwell.

Acute Symptoms/Effects:

Inhalation (Breathing): Respiratory System Effects: Pulmonary irritation, cough, chest discomfort, shortness of breath, headache, euphoria, nausea and vomiting, respiratory irritation. Changes in heart rate, paresthesias, sleepiness and seizures are described. Heavy exposure can result in muscle weakness or hypotonia, syncope, stupor followed by loss of consciousness. Complications include cardiac abnormalities and elevations of carboxyhemoglobin. Coma with respiratory depression may result in death.

Skin: Skin Irritation. Skin exposure may cause intense burning sensation, mild redness and numbness. Severe burns may develop following prolonged exposures.

Eye: Eye Irritation. Mild eye irritation may occur when exposed to vapor. Splash of liquid in the eye can cause conjunctival irritation and burning pain. Prolonged contact can cause severe corneal burns.

Ingestion (Swallowing): Ingesting this material may cause nausea, vomiting, mucosal irritation with burning sensation. System effects include central nervous system depression, headache, syncope, seizures, and coma. Ingesting concentrated solutions of this material can cause corrosion of the GI tract and perforation. The minimum oral lethal dose is estimated at 0.5 to 5 ml/kg. Lesser amounts may cause significant toxicity.

Delayed Symptoms/Effects:
May cause cancer. Repeated or prolonged exposure may cause blood and liver damage.

Most Important Symptoms/Effects (Acute and Delayed):

Protection of First-Aiders: Protect against vapor/gas exposure. Protect against liquid contamination. Most cases of serious toxicity or death have been associated with stripping operations and or use in enclosed spaces.

Notes to Physician: Acute symptoms from low airborne levels are generally mild and self limiting following removal from exposure, and should require no specific treatment. The primary exposure route is inhalation. Symptomatic exposure should be treated with oxygen. The primary toxicity is central nervous system depression. May cause cardiac arrhythmias. Treatment with non-catecholamine agent is theoretically preferred. Treat seizures with benzodiazepines. Methylene chloride is metabolized to carbon monoxide. Carbon monoxide levels may increase after exposure has ceased. Treat following carbon monoxide recommendations. For ingestion, protect the airway and do not administer fluids or attempt to decontaminate due to the risk of vomiting and aspiration. Protect the airway. May dissolve some medical grade plastics. Systemic toxicity from skin absorption is unlikely. There is no antidote.

Interaction with Other Chemicals Which Enhance Toxicity: May potentiate other agents that cause central nervous system (CNS) and respiratory system depression, such as alcohol, opiates.

Medical Conditions Aggravated by Exposure: May increase potential for cardiac arrhythmia. May increase carboxyhemoglobin levels. May worsen respiratory system disorders such as asthma and other breathing disorders. May worsen central nervous system disorders such as seizure disorders or impair central nervous system functions. May worsen ischemic heart disease.

SECTION 5. FIRE-FIGHTING MEASURES

Fire Hazard: Slight fire hazard. This material may burn, but does not readily ignite.

Extinguishing Media: Use foam, dry chemical, CO2, or water spray.

Fire Fighting: Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Concentrated vapors may be ignited by high intensity source. Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Keep water runoff out of water supplies and sewers (see Section 6 of the SDS).

Component	Immediately Dangerous to Life/ Health (IDLH)
Methylene chloride (Dichloromethane) 75-09-2	2300 ppm IDLH

Hazardous Combustion Products: Hydrogen chloride, Chlorine, Phosgene, Oxides of carbon

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Lower Flammability Level (air): 12% @ 100°C

Upper Flammability Level (air): 19% @100°C

Flash point: None

Auto-ignition Temperature: 1033 °F (556.1 °C)

Physical Hazards Not Otherwise Classified
- Not Classified

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Most vapors are heavier than air and will spread along ground and collect in low or confined areas (drains, basements, tanks). Do not breathe vapors, mist, or spray. Ventilate closed spaces before entering. Exposure in an enclosed or poorly-ventilated area may be very harmful. Keep unnecessary people away, isolate hazard area and deny entry. Evacuation of surrounding area may be necessary for large spills. Shut off ventilation system if needed. Do not get in eyes, on skin or on clothing. Wear appropriate personal protective equipment recommended in Section 8 of the SDS.

Environmental Precautions: Keep out of water supplies, sewers and soil. Avoid discharge into drains, surface water or groundwater. Releases should be reported, if required, to appropriate regulatory agencies.

Methods and Materials for Containment, Confinement, and/or Abatement: Stop leak if possible without personal risk. Ventilate closed spaces before entering. Completely contain spilled materials with dikes, sandbags, etc. Remove contaminated soil or collect with appropriate absorbent and place into suitable container. Keep container tightly closed and properly labeled. Liquid material may be removed with a properly rated vacuum truck. Properly dispose of in accordance with all applicable regulations. See Section 13, Disposal considerations, for additional information.

Methods and Materials for Clean-up:

Additional Disaster Prevention Measures: Potential Methylene Chloride exposures have special OSHA requirements as noted in CFR 1910.1052.

SECTION 7. HANDLING AND STORAGE

Handling:

Precautions for Safe Handling: Do not breathe gas, vapors, or spray mist. Most vapors are heavier than air and will spread along ground and collect in low or confined areas (drains, basements, tanks). Avoid contact with skin, eyes and clothing. Wear personal protective equipment as described in Exposure Controls/Personal Protection (Section 8)

of the SDS. Wash thoroughly after handling. Do not taste or swallow. When using, do not eat, drink or smoke.

Storage:

Safe Storage Conditions: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Store in a cool, dry area. Store in a well-ventilated area. Prevent water or moist air from entering storage tanks or containers. Do not enter confined spaces unless adequately ventilated. Do not store in aluminum container or use aluminum fittings or transfer lines. To minimize the decomposition of dichloromethane, storage containers should be galvanized or lined with a phenolic coating. Protect from sunlight. Do not reuse drum without recycling or reconditioning in accordance with any applicable federal, state or local laws. Do not use cutting or welding torches, open flames or electric arcs on empty or full containers. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet).

Incompatibilities/ Materials to Avoid: Aluminum, magnesium, zinc, and their alloys, Bases, Oxygen, Amines, Reactive metals, Sodium, Potassium, Strong oxidizing agents, Alkali metals.

Additional Information:

Physical Hazards Not Otherwise Classified
- Not Classified

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

REGULATORY EXPOSURE LIMIT(S):
Listed below for the product components that have regulatory occupational exposure limits (OEL's) established. See 29 CFR 1910.1052 (OSHA's regulatory standard for Methylene Chloride) for additional requirements when 8-hour action level (12.5 ppm TWA) is exceeded.

Component	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PELCeiling
Methylene chloride (Dichloromethane) 75-09-2	25 ppm	125 ppm	-----

OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration; PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit

NON-REGULATORY EXPOSURE LIMIT(S):
Listed below are the product components that have advisory (non-regulatory) occupational exposure limits (OEL's) established.

Component	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	Skin Absorption - ACGIH	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Methylene chloride (Dichloromethane)	50 ppm	-----	-----	Not Listed	500 ppm	2000 ppm	1000 ppm

- The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

- The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or educational institutions in the United States. The ACGIH

develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.

ENGINEERING CONTROLS: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits. Monitoring should be performed regularly in accordance with 29 CFR 1910.1052(d) to determine exposure level(s).

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear safety glasses with side-shields. Wear chemical safety goggles and/or a face-shield to protect against skin and eye contact when appropriate. Provide an emergency eyewash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear chemical resistant clothing and footwear to prevent skin contact.

Hand Protection: Wear appropriate chemical resistant gloves. Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove.

Protective Material Types: Trellchem®, Tychem®, Viton®, Polyvinyl alcohol (PVA)

Respiratory Protection: Respiratory protection requirements for methylene chloride are in 29 CFR 1910.1052(f). When concentrations are above the IDLH, or are unknown, or during spills and/or emergencies, use any supplied-air respirator that has a facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Component	Immediately Dangerous to Life/ Health (IDLH)
Methylene chloride (Dichloromethane) 75-09-2	2300 ppm IDLH

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Colorless
Odor:	Mildly sweet odor Chloroform-like odor
Molecular Weight:	84.94
Chemical Family:	Saturated aliphatic halogenated solvent
pH:	Not applicable
Melting Point/Range:	-95 (°C)
Freezing Point/Range:	-139 °F (-95 °C)
Flash point:	None
Vapor Pressure:	350 mmHg @ 20°C and 435 mmHg @ 25°C
Vapor Density (air=1):	2.9
Relative Density/Specific Gravity (water=1):	1.31 - 1.32 @ 25°C
Water Solubility:	1.32% @ 25 C or 13,000 mg/l at 25 °C
Auto-ignition Temperature:	1033 °F (556.1 °C)

Odor Threshold [ppm]:	200-300 ppm (causes olfactory fatigue)
Evaporation Rate (ether=1):	0.7
Volatility:	100% by volume
Lower Flammability Level (air):	12% @ 100°C
Upper Flammability Level (air):	19% @100°C
Viscosity:	- 0.41 (cps) @ 77°F

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal temperatures and pressures.

Reactivity: Reacts violently with active metals.

Possibility of Hazardous Reactions: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Reacts violently with active metals. Avoid contact with incompatible substances and conditions due to generation of phosgene and other toxic and irritating substances.

Conditions to Avoid: (e.g., static discharge, shock, or vibration):. None known.

Incompatibilities/ Materials to Avoid: Aluminum, magnesium, zinc, and their alloys; Bases; Oxygen; Amines; Reactive metals; Sodium; Potassium; Strong oxidizing agents; Alkali metals

Hazardous Decomposition Products: Hydrogen chloride, Chlorine, Phosgene, Oxides of Carbon

Hazardous Polymerization: Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

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POTENTIAL HEALTH EFFECTS:

TOXICITY:
Dermal exposure results in absorption but at a slower rate than via the oral or inhalation routes of exposure.

ACUTE TOXICITY:

Eye contact: Vapors may cause eye irritation. Contact may cause tearing, redness, a stinging or burning feeling, swelling, and blurred vision.

Skin contact: May cause effects ranging from mild irritation to severe pain, and possibly burns, depending on the intensity of contact. Skin absorption may occur.

Inhalation: May cause upper respiratory tract irritation and central nervous system depression with symptoms such as confusion, lightheadedness, nausea, vomiting, headache, and fatigue. Causes formation of carbon monoxide in blood which may affect the cardiovascular system and central nervous system. Continued exposure may cause unconsciousness and even death.

Ingestion: May cause nausea or vomiting. If vomiting results in aspiration, chemical pneumonia could occur.

Absorption through the gastrointestinal tract may produce central nervous system depression.

CHRONIC TOXICITY:
Liver effects have not been reported in humans, but liver changes have been observed in several long-term studies with laboratory animals. Inhalation of 500 to 3,500 ppm methylene chloride for two years produced only minimal, nonproliferative changes in the liver of Sprague Dawley rats (the no-observed-effect level was equal to 200 ppm) and no liver effects in hamsters. Nonproliferative changes were noted in rats in another study after exposure to 1,000 to 4,000 ppm. Liver enlargement has been observed in mice exposed to 2,000 and 4,000 ppm of methylene chloride for 11 days.

Chronic Effects: May cause liver damage. May cause cancer based on animal data.

SIGNS AND SYMPTOMS OF EXPOSURE:

Inhalation (Breathing): Respiratory System Effects: Pulmonary irritation, cough, chest discomfort, shortness of breath, headache, euphoria, nausea and vomiting, respiratory irritation. Changes in heart rate, paresthesias, sleepiness and seizures are described. Heavy exposure can result in muscle weakness or hypotonia, syncope, stupor followed by loss of consciousness. Complications include cardiac abnormalities and elevations of carboxyhemoglobin. Coma with respiratory depression may result in death.

Skin: Skin Irritation. Skin exposure may cause intense burning sensation, mild redness and numbness. Severe burns may develop following prolonged exposures.

Eye: Eye Irritation. Mild eye irritation may occur when exposed to vapor. Splash of liquid in the eye can cause conjunctival irritation and burning pain. Prolonged contact can cause severe corneal burns.

Ingestion (Swallowing): Ingesting this material may cause nausea, vomiting, mucosal irritation with burning sensation. System effects include central nervous system depression, headache, syncope, seizures, and coma. Ingesting concentrated solutions of this material can cause corrosion of the GI tract and perforation. The minimum oral lethal dose is estimated at 0.5 to 5 ml/kg. Lesser amounts may cause significant toxicity.

Interaction with Other Chemicals Which Enhance Toxicity: May potentiate other agents that cause central nervous system (CNS) and respiratory system depression, such as alcohol, opiates.

****

GHS HEALTH HAZARDS:

GHS: CONTACT HAZARD - SKIN: Category 2 - Causes skin irritation
GHS: CONTACT HAZARD - EYE: Category 2A - Causes serious eye irritation
GHS: ACUTE TOXICITY - ORAL: Category 4 - Harmful if swallowed
GHS: TARGET ORGAN TOXICITY (SINGLE EXPOSURE): Category 1 - Causes damage to cardiovascular system including elevated carboxyhemoglobin levels
Category 3 - May cause drowsiness or dizziness
Category 3 - May cause respiratory tract irritation
GHS: TARGET ORGAN TOXICITY (REPEATED EXPOSURE): Category 2 - May cause damage to Blood and Hepatic System through prolonged or repeated exposures
GHS: ASPIRATION HAZARD: Category 2 - May be harmful if swallowed and enters airways
GHS: CARCINOGENICITY: Category 2 - Suspected of causing cancer

TOXICITY DATA:

PRODUCT TOXICITY DATA:

LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
985 mg/kg (rat) mg/kg (Rat)	> 2,000 mg/kg (Rat)	76000 mg/m^3 (4 hr-Rat)

METHYLENE CHLORIDE

COMPONENT TOXICITY DATA: The component toxicity data is populated by the LOLI database and may differ from the product toxicity data given.

Component	LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
Methylene chloride (Dichloromethane) 75-09-2	1600 mg/kg (Rat)	> 2000 mg/kg (rat)	86 mg/L (mouse, 4 hour)

!!!IRRITATION DATA: Methylene Chloride: 810 mg/24 hour(s) skin-rabbit severe; 100 mg/24 hour(s) skin-rabbit moderate; 162 mg eyes-rabbit moderate; 10 mg eyes-rabbit mild; 500 mg/24 hour(s) eyes-rabbit mild
Skin Absorbent / Dermal Route: Yes.

!!!CARCINOGENICITY COMMENT: Methylene chloride is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) that are not considered relevant to worker exposure. Available epidemiological studies do not confirm an increased risk of cancer in humans. Available evidence suggests that this material is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.

SPECIFIC TARGET ORGAN TOXICITY (Single Exposure): Category 1 - Causes damage to cardiovascular system including elevated carboxyhemoglobin levels
Category 3 - Narcotic Effects
Category 3 - Respiratory Tract Irritation

SPECIFIC TARGET ORGAN TOXICITY (Repeated or Prolonged Exposure): Category 2 - Blood, Liver.

!!!MUTAGENICITY: Company's GHS Self-Classification for mutagen category: Not classified as a mutagen. Positive results have been observed in the Ames test. In mammalian systems, responses have generally been negative.
DEVELOPMENTAL TOXICITY: Not classified as a developmental or reproductive toxin per GHS criteria. May cross the placenta. May be excreted in breast milk. No significant developmental effects were observed in female rats and mice exposed to 1,250 ppm during gestation. A similar result was observed in rats exposed to 4,500 ppm before and during gestation. A two-generation inhalation study showed no adverse reproductive effects in rats exposed to as much as 1,500 ppm for 14 weeks.

ASPIRATION HAZARD: Category 2 - May be harmful if swallowed and enters airways

TOXICOKINETICS: Not available.

METABOLISM: Not available.

ENDOCRINE DISRUPTOR: Not available.

NEUROTOXICITY: Not Available.

IMMUNOTOXICITY: A study found there was no evidence of harm to the immune system of laboratory animals or reduced ability to combat disease.

Hazard Not Otherwise Classified (HNOC)-Health
• Methylene chloride can be metabolized to carbon monoxide (CO), which is then very tightly bound to hemoglobin. This complex is called carboxyhemoglobin (COHb) and results in a reduction in the oxygen carrying capacity of the blood. This product may be absorbed through the skin, causing systemic effects
• Exposure in an enclosed or poorly-ventilated area may be very harmful
• This material may be absorbed across the skin causing systemic effects
• ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE

SECTION 12. ECOLOGICAL INFORMATION

ECOTOXICITY (EC, IC, AN LC):

Ecotoxicity - Available LOLI Data for Components: As noted in table below:

Component	Freshwater Fish	Invertebrate Toxicity:	Algae Toxicity:	Other Toxicity:
Methylene chloride (Dichloromethane)	*LC50 Pimephales promelas: 140.8 - 277.8 mg/L 96h flow-through *LC50 Pimephales promelas: 262 - 855 mg/L 96h static *LC50 Lepomis macrochirus: 193 mg/L 96h static *LC50 Lepomis macrochirus: 193 mg/L 96h flow-through	*EC50 Daphnia magna: 190 mg/L 48h *EC50 Daphnia magna: 1532 - 1847 mg/L 48h	*EC50 Pseudokirchneriella subcapitata (96 h) >500 mg/L *EC50 Pseudokirchneriella subcapitata (72 h) >500 mg/L	*LC50 Eisenia foetida (48 h filter paper) =0.3 mg/cm2 *LC50 Eisenia foetida (48 h filter paper) =304 mg/cm2

Fish Toxicity:
LC50 (Static) Fathead minnow = 310 mg/L (96 hr)
LC50 (Static) Bluegill sunfish = 220 mg/L (96 hr)

Invertebrate Toxicity:
LC50 Mysid Shrimp = 256 mg/L 96 hour(s)
224 mg/L 48 hour(s) LC50 Daphnia Magna

FATE AND TRANSPORT:

PERSISTENCE: AIR: This material released to the atmosphere will degrade by reaction with hydroxyl radicals with a half-life of several months. It is not subject to direct photo oxidation. SOIL: On land is expected to evaporate rapidly into the atmosphere due to its high vapor pressure. It is poorly adsorbed to soil and can leach into the groundwater. Calculated Adsorption Coefficient (log KOC) is 1. WATER: This material is subject to rapid evaporation, with estimated evaporative half-lives ranging from 3 to 5.6 hours under moderate mixing condition. This material has a negligible rate of hydrolysis.

BIODEGRADATION: Biodegradation may occur in groundwater, but will be very slow compared with evaporation.

BIOCONCENTRATION: Bioconcentration potential in aquatic organisms is low with BCF of 2.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from material:
Reuse or reprocess, if possible. Keep out of water supplies, sewers and soil. Dispose in accordance with all applicable regulations. May be subject to disposal regulations.

Container Management:
Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container rinsate must be disposed of in compliance with applicable regulations.

SECTION 14. TRANSPORT INFORMATION

LAND TRANSPORT

U.S. DOT 49 CFR 172.101:

UN NUMBER: UN1593
PROPER SHIPPING NAME: Dichloromethane
HAZARD CLASS/ DIVISION: 6.1
PACKING GROUP: III
LABELING REQUIREMENTS: 6.1

RQ (lbs.): RQ 1,000 Lbs. (Dichloromethane)

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

UN NUMBER: UN1593
SHIPPING NAME: Dichloromethane
CLASS OR DIVISION: 6.1
PACKING/RISK GROUP: III
LABELING REQUIREMENTS: 6.1

MARITIME TRANSPORT (IMO / IMDG)

UN NUMBER: UN1593
PROPER SHIPPING NAME: Dichloromethane
HAZARD CLASS / DIVISION: 6.1
Packing Group: III
LABELING REQUIREMENTS: 6.1

SECTION 15. REGULATORY INFORMATION

U.S. REGULATIONS

OSHA REGULATORY STATUS:
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	U.S. DOT Hazardous Substances/ RQs	CERCLA Hazardous Substances / RQs	CERCLA Section 302 EHS EPCRA RQs	Section 302 Threshold Planning Quantity (TPQs)
Methylene chloride (Dichloromethane) 75-09-2 (100)	1000 lbs(RQ)	1000 lb(final RQ)	Not listed	Not Listed

SARA EHS Chemical (40 CFR 355.30)
If a release is reportable under EPCRA, notify the state emergency response commission and local emergency planning committee. If the TPQ is met, facilities are subject to reporting requirements under EPCRA Sections 311 and 312.

EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.10):
Acute Health Hazard, Chronic Health Hazard

SARA HAZARD CATEGORIES ALIGNED WITH GHS (2018):
Health Hazard - Carcinogen
Health Hazard - Acute Toxin (any route of exposure)
Health Hazard - Skin Corrosion or Irritation
Health Hazard - Serious eye damage or eye irritation
Health Hazard - Specific Target Organ Toxicity (STOT) Single Exposure (SE)
Health Hazard - Specific Target Organ Toxicity (STOT) Repeat Exposure (RE)
Health Hazard - Aspiration Hazard

EPCRA SECTION 313 (40 CFR 372.65):
The following chemicals are listed in 40 CFR 372.65 and may be subject to Community Right-to Know Reporting requirements.

Component	SARA 313 - Emission Reporting	SARA 313 PBT
Methylene chloride (Dichloromethane) 75-09-2 (100)	0.1% (de minimis concentration)	Not Listed

OSHA SPECIFICALLY REGULATED SUBSTANCES:
• OSHA 29 CFR 1910.1052 (Methylene chloride); The U.S. Department of Labor, Occupational Safety and Health Administration specifically regulates manufacturing, handling and processing of methylene chloride. Such regulations have been published at 29 CFR 1910.1052

OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):
Not regulated.

FDA: This material has Generally Recognized As Safe (GRAS) status under specific U.S. Food and Drug Administration (FDA) regulations. Additional information is available from the Code of Federal Regulations, which is accessible on the FDA's website. Only food grade product is guaranteed to be produced under all current Good Manufacturing Practices (cGMP) requirements as defined by the FDA. Food grade product is produced in a facility

that is accredited as a Safe Quality Food (SQF) Level 2 Facility, certified under the Global Food Safety Initiative (GFSI), and meets the Food Chemical Codex (FCC) requirements.

Component	Clean Water Act - Priority Pollutants	CAA - ODS CLASS 1 AND CLASS 2	CAA - Volatile Organic Compounds (VOCs) in SOCMI	CAA - HON Rule - Organic HAPs	CAA - Hazard Air Pollutants	CAA - Urban HAPs List (Integrated Urban Strategy)	SNAP - Substitutes for ODS	EPA RMP Toxic or Flammable TPQ
Methylene chloride (Dichloromethane)	Present	Not Listed	Present	Present	Present	Present	Not Listed	Not Listed

NATIONAL INVENTORY STATUS

Component	TSCA Inventory	TSCA ACTIVE LIST	TSCA 12(b)	TSCA - Section 4	TSCA - Section 5	TSCA - Section 6	TSCA - Section 8
Methylene chloride (Dichloromethane) 75-09-2 (100 %)	Listed	ACTIVE	Imports/Exports Regulated	Not listed	Not Listed	Chemicals subject to Risk Evaluation	Listed

Toxic Substance Control Act (TSCA) Restriction of Use:
This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

TSCA 12(b): Methylene Chloride is subject to TSCA 12(b) annual reporting requirements (per country)
De minimis reporting level: 0.1%
TSCA Section(s): 6(a).

CANADIAN CHEMICAL INVENTORY: All components of this product are listed on either the DSL or the NDSL.

Component	DSL	NDSL
Methylene chloride (Dichloromethane) 75-09-2 (100)	Listed	Not Listed

STATE REGULATIONS

California Proposition 65:
This product contains a chemical known to the State of California to cause cancer, and/or birth defects, and/or other reproductive harm as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act.

Component	California Proposition 65 Cancer WARNING:	California Proposition 65 CRT List - Male reproductive toxin:	California Proposition 65 CRT List - Female reproductive toxin:	Massachusetts Right to Know Hazardous Substance List	Rhode Island Right to Know Hazardous Substance List
Methylene chloride (Dichloromethane)	Listed	Not Listed	Not Listed	Listed	Listed

Component	New Jersey Right to Know Hazardous Substance List	New Jersey Special Health Hazards Substance List	New Jersey - Environmental Hazardous Substance List	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Environmental Hazard List
Methylene chloride (Dichloromethane)	1255	Not Listed	Listed	Listed	Present	Present	Present

CANADIAN REGULATIONS

METHYLENE CHLORIDE

SDS No.: M47008 **Rev. Date:** 24-Jul-2019
Supersedes Date: 08-Apr-2019

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Component	Canada - CEPA - Schedule I - List of Toxic Substances	Canada - NPRI	Canada - CEPA - 2010 Greenhouse Gases (GHG) Subject to Mandatory Reporting	CANADIAN CHEMICAL INVENTORY:	NDSL:
Methylene chloride (Dichloromethane) 75-09-2 (100)	Present (037) Present (065)	Part 1, Group 1 Substance Part 4 Substance	Not Listed	Listed	Not Listed

SECTION 16. OTHER INFORMATION

Prepared by: Occidental Chemical Corporation - HES&S Product Stewardship Department

Rev. Date: 24-Jul-2019

Reason for Revision:
• Updated SECTIONS 1 and 15 based on finalization of EPA's Risk Assessment Evaluation under TSCA Section 6(a)
• Added emphasis on Uses Advised Against: SEE SECTION 1
• Included additional information for other usage that may be restricted and/or prohibited: SEE SECTION 1
• Added Hazards Not Otherwise Classified (HNOC): SEE SECTION 2
• WHMIS Classifications were removed from format: SEE SECTION 15

IMPORTANT:
The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESSED OR IMPLIED, IS MADE REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, storage, disposal and other factors that may involve other or additional legal, environmental, safety or performance considerations, and Occidental Chemical Corporation assumes no liability whatsoever for the use of or reliance upon this information. While our technical personnel will be happy to respond to questions, safe handling and use of the product remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patents or to violate any federal, state, local or foreign laws.

OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Safety Data Sheet available to your employees.

End of Safety Data Sheet

CORRECTIVE MEASURES WORK PLAN – 755 JEFFERSON ROAD, ROCHESTER, NY
COVID-19 HEALTH & SAFETY PLAN ADDENDUM (JULY 21, 2020)

BACKGROUND AND PURPOSE

This document is intended to supplement LaBella's Health and Safety Plan (HASP). Said HASP is included in Appendix 1 of the Corrective Measures Work Plan (CMWP) dated July 2020.

The purpose of this HASP addendum is to address additional health and safety pre-cautions and procedures to be implemented during the implementation of the CMWP to address potential health threats associated with the COVID-19 virus. The guidelines and procedures detailed in this addendum are intended to minimize COVID-19 health risks for LaBella employees and related contractors, Unither staff, and the general public during the project. Note that this HASP addendum is subject to change pending the CMWP implementation timeframe and COVID-19 virus infection rates at that time.

Procedures and guidelines set forth in the original HASP will continue to be adhered to during work, and will be supplemented by the measures detailed herein. This addendum will be updated as necessary to reflect new developments and/or information related to the COVID-19 virus.

ABOUT COVID-19

SARS-CoV-2, the novel coronavirus disease, commonly referred to as COVID-19, is a respiratory illness that can spread from person to person. Infection with COVID-19 can cause mild to severe illness and, in some cases, death. Typical symptoms include fever, cough and shortness of breath, but other non-respiratory symptoms have been reported. Asymptomatic cases, or cases with no symptoms at all, have also been documented. According to the U.S. Department of Health and Human Services' Centers for Disease Control and Prevention (CDC), symptoms of COVID-19 may appear in as few as 2 days or as long as 14 days after exposure.

Information posted by the CDC indicates that COVID-19 is a new disease and, therefore, we are still learning about how it spreads and the severity of the illness it causes. Per the CDC, the virus is thought to spread mainly from person-to-person in the following ways:

- Between people who are in close contact with one another (within about 6 feet); and
- Through respiratory droplets produced when an infected person coughs, sneezes or talks that can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs.

For these reasons, maintaining a good social distance of at least 6 feet is recommended by the CDC. Furthermore, it is important to note that some people without symptoms may be able to spread the virus.

Contact with surfaces or objects that have been contaminated by the virus followed by touching of the mouth, nose or possibly eyes is another potential means of contracting the virus. Consequently, the CDC recommends that people practice frequent hand washing or disinfection, and that frequently touched surfaces/objects be regularly cleaned or disinfected.

The CDC has determined that older adults and people of any age that have underlying medical conditions, such as Asthma, autoimmune deficiencies, chronic lung disease, serious heart conditions etc., might be at a higher risk for severe illness from COVID-19. A list of underlying medical conditions that could place persons at a higher risk are included in Attachment A.

More information concerning COVID-19 is available at the CDC website: www.cdc.gov/coronavirus/2019-ncov.

SELF MONITORING

All project staff shall conduct self-monitoring and shall adhere to the following directives:

- **Do not** report to the job site if you feel ill;
- If you have COVID-19 symptoms (i.e., fever, cough or shortness of breath), **do not** report to work and notify your supervisor at the immediate onset of symptoms;
- Sick employees should follow CDC-recommended steps, and **should not** return to work until the criteria to discontinue home isolation are met, in consultation with healthcare providers and state and local health departments. Prior to reporting to work, the employee must discuss re-admittance with your supervisor; and
- Employees who are well but who have a sick family member at home with COVID-19 or have been in close contact with a person that has contracted COVID-19 **should not** report to work, and should notify their supervisor and follow CDC recommendations.

Additionally, any person working on the job site that becomes ill during the course of a work day shall remotely notify their supervisor and return home. Under the Occupational Safety and Health Administration (OSHA) recordkeeping requirements, COVID-19 is a recordable illness and employers are responsible for recording confirmed cases of COVID-19 that are work-related. LaBella shall comply with the OSHA recordkeeping requirements as it relates to COVID-19 should a member of the project staff contract COVID-19 as a result of exposure at work.

Site managers will continue to evaluate the continuity of operations should personnel experience symptoms, come into contact with those exhibiting symptoms or test positive for the COVID-19 disease.

TRAVEL TO/FROM THE WORK SITE

All staff shall travel to/from the job site each day (no overnight hotel stays will be allowed). Additionally, project staff shall adhere to the following travel guidelines:

- Limit vehicle occupancy to one person;
- Limit time spent at locations between the work site and residence;
- Avoid un-necessary stops or diversions; and
- If more than one employee operates a vehicle, wipe down commonly touched vehicle components (i.e., steering wheel, gear shift, radio and climate control buttons, door handles. etc.) with disinfectant wipes before each use by different individuals.

SOCIAL DISTANCING REQUIREMENT

All project staff shall comply with the CDC's social distancing guideline of maintaining a minimum of 6 feet of separation between individuals during the performance of all project activities, including job site meetings, communications with co-workers, hand excavation/raking, laying sod, equipment maintenance, etc. If necessary, manual labor shall be conducted in shifts to avoid project staff working in close proximity.

Additionally, project staff shall comply with the following guidelines relating to field office use and breaks:

- No more than one person shall occupy the field office at any time;
- Personnel shall practice good hygiene prior to taking breaks and/or consuming food;
- Social distancing requirements shall be adhered to during all breaks (i.e., coffee, lunch, etc.); and
- Group meals shall be prohibited.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

All necessary PPE will be supplied to workers by the employer. In addition to the PPE specified in the HASP, the following additional PPE shall be utilized by project staff:

- Face Coverings – Face coverings (e.g., masks, cloth, etc.) over the nose and mouth shall be worn at all times on the project site; and,
- Gloves – nitrile or latex gloves shall be worn at all times while outside the exclusion zone on the project site.

Do not share PPE under any circumstances. Used PPE shall be placed in garbage bags, sealed and secured each day until proper disposal is facilitated. Un-used PPE will be continuously secured to prevent theft.

PERSONAL HYGIENE & DISINFECTION

All project staff shall practice good personal hygiene while working on the job site. This shall include the following safe work practices:

- Wash hands frequently with soap and water for at least 20 seconds. A hand washing station will be provided at the job site to enable this practice;
- Use hand sanitizer containing at least 60% alcohol when hand washing is not practical;
- Avoid touching your mouth, nose or eyes; and
- Cover coughs and sneezes with the inside of your elbow.

Additionally, commonly used surfaces within the field office shall be wiped down with alcohol or disinfectant wipes at the beginning of each work day.

DEDICATED TOOLS AND EQUIPMENT

To the extent possible, hand tools and equipment shall be dedicated for use by a single individual. To facilitate this practice, hand tools shall be labeled with the initials of the individual to which they have been designated and shall not be used by others without disinfection.

Similarly, the heavy equipment shall be dedicated to one operator to the extent possible. All project staff shall be informed each day of the operator designated for each piece of equipment during the morning tailgate meeting. Should project conditions dictate the use of heavy equipment by multiple operators, commonly used surfaces of the equipment (i.e., door handles, controls, safety levers, etc.) shall be wiped down with disinfectant wipes before use by each different individual.

APPENDIX 2

Quality Control Program

Quality Control Program (QCP)

Location:

Unither Manufacturing LLC
755 Jefferson Road
Rochester, New York 14623

September 2019

300 State Street, Suite 201 | Rochester, NY 14614 | p 585-454-6110 | f 585-454-3066
www.labellapc.com

Table of Contents

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1.0 Introduction

LaBella's Quality Control Program (QCP) is an integral part of its approach to environmental investigations. By maintaining a rigorous QC program, our firm is able to provide accurate and reliable data. This QCP should be followed during implementation of environmental investigation and remediation projects and should serve as a basis for quality control methods to be implemented during field programs. Project-specific requirements may apply.

The QC program contains procedures which allow for the proper collection and evaluation of data and documents that QC procedures have been followed during field investigations. The QC program presents the methodology and measurement procedures used in collecting quality field data. This methodology includes the proper use of equipment, documentation of sample collection, and sample handling procedures.

Procedures used in the firm's QC program are compatible with federal, state, and local regulations, as well as, appropriate professional and technical standards.

This QC program includes the following:

- QC Objectives and Checks
- Field Equipment, Handling, and Calibration
- Sampling and Logging Techniques
- Sample Handling, Packaging, and Shipping
- Laboratory Requirements and Deliverables

It should be noted that project-specific work plans (e.g., Remedial Investigation Work Plans) may have project specific details that will differ from the procedures in this QC program. In such cases, the project-specific work plan should be followed (subsequent to regulatory approval).

The characteristics of major importance for the assessment of generated data are accuracy, precision, completeness, representativeness, and comparability. Application of these characteristics to specific projects is addressed later in this document. The characteristics are defined below.

1.1 Accuracy

Accuracy is the degree of agreement of a measurement or average of measurements with an accepted reference or "true" value and is a measure of bias in the system.

1.2 Precision

Precision is the degree of mutual agreement among individual measurements of a given parameter.

1.3 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions.

1.4 Representativeness

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition

Careful choice and use of appropriate methods in the field will ensure that samples are representative. This is relatively easy with water or air samples since these components are homogeneously dispersed. In soil and sediment, contaminants are unlikely to be evenly distributed, and thus it is important for the sampler and analyst to exercise good judgment when removing a sample.

1.5 Comparability

Comparability expresses the confidence with which one data set can be compared to another. The data sets may be inter- or intra- laboratory.

2.0 Measurement of Data Quality

2.1 Accuracy

Accuracy of a particular analysis is measured by assessing its performance with "known" samples. These "knowns" take the form of EPA standard reference materials, or laboratory prepared solutions of target analytes spiked into a pure water or sample matrix. In the case of gas chromatography (GC) or GC/MS (mass spectrometry) analyses, solutions of surrogate compounds are used. These solutions can be spiked into every sample and are designed to mimic the behavior of target analytes without interfering with their determination.

In each case the recovery of the analyte is measured as a percentage, correcting for analytes known to be present in the original sample if necessary, as in the case of a matrix spike analysis. For EPA supplied known solutions, this recovery is compared to the published data that accompany the solution.

For the firm's prepared solutions, the recovery is compared to EPA-developed data or the firm’s historical data as available. For surrogate compounds, recoveries are compared to EPA CLP acceptable recovery tables.

If recoveries do not meet required criteria, then the analytical data for the batch (or, in the case of surrogate compounds, for the individual sample) are considered potentially inaccurate. The analyst or his supervisor must initiate an investigation of the cause of the problem and take corrective action. This can include recalibration of the instrument, reanalysis of the QC sample, reanalysis of the samples in the batch, or flagging the data as suspect if the problems cannot be resolved. For

highly contaminated samples, recovery of the matrix spike may depend on sample homogeneity. As a rule, analyses are not corrected for recovery of matrix spike or surrogate compounds.

2.2 Precision

Precision of a particular analysis is measured by assessing its performance with duplicate or replicate samples. Duplicate samples are pairs of samples taken in the field and transported to the laboratory as distinct samples. Their identity as duplicates is typically not known to the laboratory. For most purposes, precision is determined by the analysis of replicate pairs (i.e., two samples prepared at the laboratory from one original sample). Often in replicate analysis the sample chosen for replication does not contain target analytes so that quantitation of precision is impossible. For EPA CLP analyses, replicate pairs of spiked samples, known as matrix spike/matrix spike duplicate samples, are used for precision studies. This has the advantage that two real positive values for a target analyte can be compared.

Precision is calculated in terms of Relative Percent Difference (RPD).

- Where X_1 and X_2 represent the individual values found for the target analyte in the two replicate analyses or in the matrix spike/matrix spike duplicate analyses.
- RPDs must be compared to the method RPD for the analysis. The analyst or his supervisor must investigate the cause of RPDs outside stated acceptance limits. This may include a visual inspection of the sample for non-homogeneity, analysis of check samples, etc. Follow-up action may include sample reanalysis or flagging of the data as suspect if problems cannot be resolved.
- During the data review and validation process, field duplicate RPDs are assessed as a measure of the total variability of both field sampling and laboratory analysis.

2.3 Completeness

Completeness for each parameter is calculated as follows:

- The firm's target value for completeness for all parameters is 100%. A completeness value of 95% will be considered acceptable. Incomplete results will be reported to the site managers. In planning the field sample collection, the site manager will plan to collect field duplicates from identified critical areas. This procedure should assure 100% completeness for these areas.

2.4 Representativeness

The characteristic of representativeness is not quantifiable. Subjective factors to be taken into account are as follows:

- The degree of homogeneity of a site;
- The degree of homogeneity of a sample taken from one point in a site; and
- The available information on which a sampling plan is based.

To maximize representativeness of results, sampling techniques and sample locations will be carefully chosen so that they provide laboratory samples representative of the site and the specific area. Within the laboratory, precautions are taken to extract from the sample bottle an aliquot representative of the whole sample. This includes premixing the sample and discarding pebbles from soil samples.

2.5 Comparability

Comparability of laboratory tests is ensured by utilizing only New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)- certified laboratories. This certification is the basis for demonstrating proficiency in testing requirements. Using ELAP certified laboratories will result in consistency amongst analytical data within a specific project and across projects.

3.0 Quality Control Targets

Target values for detection limit, percent spike recovery and percent "true" value of known check standards, and RPD of duplicates/replicates are included in the QCP, Analytical Procedures. Note that tabulated values are not always attainable. Instances may arise where high sample concentrations, non-homogeneity of samples, or matrix interferences preclude achievement of target detection limits or other quality control criteria. In such instances, the firm will report reasons for deviations from these detection limits or noncompliance with quality control criteria.

4.0 Soil Boring Advancement & Monitoring Well Installation Procedures

Soil and groundwater sampling shall be conducted in accordance with NYSDEC Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation dated May 3, 2010 and any Site-specific work plans.

Prior to drilling, all drill sites will be cleared with appropriate utility companies to avoid potential accidents relating to underground utilities. Utility drawings will be reviewed, if available.

4.1 Drilling Equipment and Techniques

<u>Direct Push Geoprobe Advanced Borings:</u>

Soil borings and monitoring wells will be advanced with a Geoprobe direct push sampling system. The use of direct push technology allows for rapid sampling, observation, and characterization of relatively shallow overburden soils. The Geoprobe utilizes a four to five-foot macrocore sampler, with disposable polyethylene sleeves. Soil cores will be retrieved in four or five-foot sections, and can be easily cut from the polyethylene sleeves for observation and sampling. The macrocore sampler will be decontaminated between boring locations using an alconox and water solution.

Prior to initiating drilling activities, the Macrocores, drive rods, and pertinent equipment, will be

steam cleaned or washed with an alconox and water solution. This cleaning procedure will also be used between each boring. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used.

Test borings will be advanced with 2-inch (or larger) inside diameter (ID) direct push Macrocore through overburden soils. Drilling fluids, other than potable water will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

During the drilling, a properly calibrated photoionization detector (PID) will be used to screen soil cores retrieved from the Macrocores.

Direct Push Geoprobe advanced groundwater-monitoring wells typically utilize minimum 1.25-inch threaded flush joint PVC pipe with 0.010-in. slotted screen or pre-packed well screens. PVC piping used for risers and screens will conform to the requirements of ASTM-D 1785 Schedule 40 pipe.. All materials used to construct the wells will be NSF/ASTM approved. Solvent PVC glue shall not be used at any time in the construction of the wells. The bottom of the screen shall be sealed with a treated cap or plug. No lead shot or lead wool is to be employed in sealing the bottom of the well or for sealant at any point in the well. Stainless steel wells or pre-packed PVC wells may be used if specified in the work plan and approved by the NYSDEC.

Hollow-Stem Auger Advanced Borings:

The drilling and installation of soil borings and monitoring wells will be performed using a rotary drill rig which will have sufficient capacity to perform 4 1/4-inch inside diameter (ID) hollow-stem auger drilling in the overburden, retrieve Macrocore or split-spoon samples, and perform necessary rock coring using NX, NQ, HQ or core barrel size as specified in the project-specific work plan. The borehole may be reamed up to 5 1/2-inch diameter prior to monitoring well installation as cased hole in the bedrock, or may be left as open bedrock hole, with regulatory concurrence. Equipment sizes and diameters may vary based on project-specific criteria. Any investigative derived waste generated during the advancement of soil borings and monitoring well installations will be containerized and characterized for proper disposal.

Prior to initiating drilling activities, the augers, rods, Macrocore, split spoons, and other pertinent equipment will be steam cleaned or washed with an alconox and water solution. This cleaning procedure will also be used between each boring. Steam cleaning activities will be performed in a designated on-site decontamination area. During and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used.
Test borings will be advanced with 4 1/4-inch (ID) hollow stem augers through overburden, and cored with a NX, NQ, HQ or core barrel size as specified in the project-specific work plan sized diamond core barrels in competent rock, driven by truck-, track-, or trailer-mounted drilling equipment. Alternative methods of drilling or equipment may be allowed or requested for project-specific criteria, but must be approved by the NYSDEC. Drilling fluids, other than water from a

NYSDEC-approved source, will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

During the drilling, a (PID) will be used to screen soils retrieved from the split spoons or Macrocores.

Where bedrock wells are required, test borings shall be advanced into rock with NX, NQ, HR (or similar) coring tools. Only water from an approved source shall be used in rock coring. The consultant shall monitor and record the petrology, core recovery, fractures, rate of advance, and water lost or produced in each test boring. The Rock Quality Determination (RQD) value shall be calculated for each 5-foot core. Each core shall be screened with a PID upon extraction. All core samples shall be retained and stored by the consultant in an approved wooden core box for a period of not less than one year.

The method selected may be percussion or rotary drilling. The method and equipment selected must be capable of penetrating the bedrock at each well location to a depth required by the work plan.

Bedrock well installation will involve construction of a rock socket in the weathered bedrock. The socket will be drilled into the top of rock (typically 1-ft. to 5-ft. into the top of rock) at each bedrock well location to allow a permanent steel casing to be grouted securely in place prior to completion of the well. The purpose for this is to provide a seal at the overburden/bedrock interface and into the upper bedrock surface, to prevent the entrance of overburden water into the bedrock. After the grout and casing have set up for a minimum of 12 hours, the remaining bedrock can be NX (or similar) cored through the steel casing to a depth determined by the project-specific work plan.

Bedrock wells will either be open coreholes in the rock or consist of threaded, flush-joint PVC piping. Construction will vary depending on the project and as such, specific construction of the wells will be detailed in the project-specific work plan. Bedrock wells which do utilized PVC piping for risers and screens will conform to the requirements of ASTM-D 1785 Schedule 40 pipe. All materials used to construct the wells will be NSF/ASTM approved.

Screen and riser sections shall be joined by flush-threaded coupling to form watertight unions that retain 100% of the strength of the casing. Solvent PVC glue shall not be used at any time in the construction of the wells. The bottom of the screen shall be sealed with a treated cap or plug. No lead shot or lead wool is to be employed in sealing the bottom of the well or for sealant at any point in the well.

4.1.1 Artificial Sand Pack

When utilized, granular backfill will be chemically and texturally clean, inert, siliceous, and of appropriate grain size for the screen slot size and the host environment The sand pack will be installed using a tremie pipe, when possible (i.e., a tremie pipe may not fit into smaller, 2-in. diameter boreholes). When utilized, the well screen and casing will be installed, and the sand pack placed around the screen and casing to a depth extending at least 2-ft.. A pre-packed well screen may be used if pre-approved by the NYSDEC.

An artificial sand pack will not be utilized in bedrock wells without screens (i.e., open borehole wells).

4.1.2 Bentonite Seal

A minimum 2-ft. thick seal will be placed directly on top of the sand pack, and care will be taken to avoid bridging. In the event that Site geology does not allow for a 2-ft. seal (e.g., only 1-ft. of space remains between the top of the sand pack and ground surface), the remaining space in the annulus will be filled with bentonite.

4.1.3 Grout Mixture

Upon completion of the bentonite seal, the well may be grouted with a non-shrinking cement grout (e.g., Volclay^{R}) mix to be placed from the top of the bentonite seal to the ground surface. The cement grout shall consist of a mixture of Portland cement (ASTM C 150) and water, in the proportion of not more than 7 gallons of clean water per bag of cement (1 cubic foot or 94 pounds). Additionally, 3% by weight of bentonite powder may be added.

4.1.4 Surface Protection

At all times during the progress of the work, precautions shall be used to prevent tampering with or the entrance of foreign material into the well. Upon completion of the well, a suitable cap shall be installed to prevent material from entering the well. Where permanent wells are to be installed, the well riser shall be protected by a flush mounted road box set into a concrete pad or locking well cap for stick-up wells. A concrete pad, sloped away from the well, shall be constructed around the flush mount road box or stick-up casing at ground level.

Any well that is to be temporarily removed from service or left incomplete due to delay in construction shall be capped with a watertight cap.

4.2 Surveying

Coordinates and elevations will be established for each monitoring well and sampling location. Elevations to the closest 0.01 foot shall be used for the survey. These elevations shall be referenced to a regional, local, or project-specific datum. The location, identification, coordinates, and elevations of the wells will be plotted on maps with a scale large enough to show their location with reference to other structures at each site.

4.3 Well Development

After completion of the well, but not sooner than 24 hours after grouting is completed, development will be accomplished using pumping, bailing, or surge blocking. No dispersing agents, acids, disinfectants, or other additives will be used during development or introduced into the well at any other time. During development, water will be removed throughout the entire water column by periodically lowering and raising the pump intake (or bailer stopping point).

Development water will be either properly contained and treated as waste until the results of chemical analysis of samples are obtained or discharged on Site as determined by the Site-specific work plans and/or consultation with the NYSDEC representatives on Site.

The development process will continue until removal of a minimum of 110% of the water lost during drilling, three well volumes; whichever is greater, or as specified in the work plan. In the event that limited recharge does not allow for the recovery of all drilling water lost in the well or three (3) well volumes, the well will be allowed to stabilize to conditions deemed representative of groundwater conditions. Stabilization periods will vary by project but will be confirmed with the NYSDEC prior to sampling.

5.0 Geologic Logging and Sampling

At each investigative location, borings will be advanced through overburden using either a drill rig and hollow-stem auger or direct push technology (split spoons or Macrocore). Soils will be evaluated for visual and olfactory evidence of impairment (i.e., staining, odors, and elevated PID readings) by a qualified individual. Sampling devices will be decontaminated according to procedures outlined in the Decontamination section of this document. When utilized, split-spoon samplers will be driven into the soil using a minimum 140-pound safety hammer and allowed to free-fall 30-inches, in accordance with ASTM-D 1586-84 specifications. The number of blows required to drive the sampler each 6-inches of penetration will be recorded. When required, samples will be stored in the appropriate bottleware (refer to Section 10) until analysis or deemed unnecessary.

In the event that maximum design depth of investigation is reached and hydrogeologic conditions are not suitable for well installation, the maximum drilling depth may be revised.

Boulders and bedrock encountered during well installation may be cored by standard diamond-core drilling methods using an NX, NQ, HQ size core barrel or other if specified in the project-specific work plan. All rock cores recovered will be logged by a qualified individual, and stored in labeled wooden core boxes. The cores will be stored by the firm until the project is completed or for at least one year. Drilling logs will be prepared by a qualified individual who will be present during drilling operations. One copy of each field boring and well construction log and groundwater data, will typically be submitted as part of the investigation summary report (e.g., Remedial Investigation Report). The RQD value shall be calculated for each 5-foot section. Information provided in the logs shall include, but not be limited to, the following:

- Date(s), test hole identification, and project identification;
- Name of individual developing the log;
- Name of driller and assistant(s);
- Drill, make and model, auger size;
- Identification of alternative drilling methods used and justification thereof (e.g., rotary drilling with a specific bit type to remove material from within the hollow stem augers);
- Standard penetration test (ASTM D-1586) blow counts;
- Field diagram of each monitoring well installed with the depth to bottom of well/ screen, top of screen, length of riser, depth of steel casing, depths of sand pack, bentonite seal, grout, type of well completion etc.;
- Depth of each change of stratum;
- Identification of the material of which each stratum is composed, according to the USCS system or standard rock nomenclature, as appropriate;

- Depth interval from which each sample was taken, sample identification, and sample time;
- Depth at which hole diameters (bit sizes) change;
- Depth at which groundwater is encountered;
- Drilling fluid and quantity of water lost during drilling;
- Depth or location of any loss of tools or equipment;
- Depths of any fractures, joints, faults, cavities, or weathered zones

6.0 Groundwater Sampling Procedures

The groundwater in all new monitoring wells will be allowed to stabilize for at least 24-hours following development prior to sampling. Water levels will be measured to within 0.01 feet prior to purging and sampling. Sampling of each well will typically be accomplished in one of two ways; active or passive.

Active Sampling:

Active sampling includes bailing or pumping. Purging will be completed prior to active sampling if specified in the project-specific work plan. During purging, the following will be recorded in field books or groundwater sampling logs:

- date
- purge start time
- weather conditions
- presence of NAPL, if any, and approximate thickness
- pump rate
- pH
- dissolved oxygen
- temperature
- conductivity
- redox
- turbidity
- depth of well
- depth to water
- purge end time
- volume of water purged

In general, wells will be purged until the pH, conductivity, temperature, dissolved oxygen, redox, and turbidity of the water being pumped from the well have stabilized with a turbidity goal of 50 NTU (may be lower for metals analysis).

Passive Sampling:

Groundwater samples will be collected via passive methods (i.e., no-purge) according to the following procedures and in the volumes specified in Table 10-1:

Samples will be collected via passive diffusion bag (PDB) samplers. PDB samplers are made

of low-density polyethylene plastic tubing (typically 4 mil), filled with laboratory grade (ASTM Type II) deionized water and sealed at both ends.

- Pre-filled PDBs will not be stored for longer than 30 days and will be kept stored at room temperature in a sealed plastic bag until ready to use.
- PDBs filled in the field will be used immediately and not stored for future use.
- PDB samplers will only be used to collect groundwater samples which will be analyzed for VOCs.
- Mesh covers will be utilized for open rock holes as to not puncture the PDB and will be secured to the bag using zip-ties.
- PDB samplers will be deployed by hanging in the well at the depth(s) specified in the project-specific work plan. The PDB samplers will be deployed at least 14 days prior to sampling;
- When transferring water from the PDB to sample containers, care will be taken to avoid agitating the sample, since agitation promotes the loss of volatile constituents;
- Gloves will be changed between collection of each PDB and tools used to open the PDB will be decontaminated with an alconox and potable water solution between each PDB;
- Any volume not used will be treated as investigation derived waste;
- Any observable physical characteristics of the groundwater (e.g., color, sheen, odor, turbidity) at the time of sampling will be recorded; and
- Weather conditions (i.e., air temperature, sky condition, recent heavy rainfall, drought conditions) at the time of sampling will be recorded.

7.0 Soil Vapor Intrusion Sampling Procedures

Soil vapor intrusion (SVI) sampling is to be conducted in accordance with the *NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York* dated October 2006 and subsequent updates. Tracer gas testing is to be conducted for sub-slab sampling points to ensure concentrations of the tracer gas are not detected in the sub-slab at greater than 10% of the concentration detected in the atmosphere. An outdoor air sample is to be collected at an upwind direction as a control. A building inventory should be completed to document building construction information and identify products that may be contributing to the levels in indoor air.

8.0 Field Documentation

8.1 Daily Logs/ Field Notebook

Daily logs are necessary to provide sufficient data and observations to enable participants to reconstruct events that occurred during the project and to refresh the memory of the field personnel if called upon to give testimony during legal proceedings. Daily logs may be kept in a project-specific notebook labelled with the project name/ number and contact information.

The daily log is the responsibility of the field personnel and will include:

- Name of person making entry;
- Start and end time of work;
- Names of team members on-site;
- Changes in required levels of personnel protection:
  - Level of protection originally used;
  - Changes in protection, if required; and
  - Reasons for changes.
- Air monitoring locations, start and end times, and equipment identification numbers;
- Summary of tasks completed;
- Summary of samples collected including location, matrix, etc.;
- Field observations and remarks;
- Weather conditions, wind direction, etc.;
- Any deviations from the work plan;
- Initials/ signature of person recording the information.

As with any data logbooks, no pages will be removed for any reason. If corrections are necessary, these must be made by drawing a single line through the original entry (so that the original entry can still be read) and writing the corrected entry alongside. The correction must be initialed and dated. Corrected errors may require a footnote explaining the correction.

Sample documents, forms, or field notebooks are not to be destroyed or thrown away, even if they are illegible or contain inaccuracies that require a replacement document. If an error is made on a document assigned to one individual, that individual may make corrections simply by crossing a line through the error and entering the corrected information. The incorrect information should not be obliterated. Any subsequent error discovered on a document should be corrected by the person who made the entry. All corrections must be initialed and dated.

8.2 Photographs

Photographs will be taken to document the work. Documentation of a photograph is crucial to its validity as a representation of an existing situation. Photographs should be documented with date, location, and description of the photograph.

9.0 Investigation Derived Waste

Purpose:

The purposes of these guidelines are to ensure the proper holding, storage, transportation, and disposal of materials that may contain hazardous wastes. Investigation-derived waste (IDW) included the following:

- Drill cuttings, drilling mud solids;

- Water produced during drilling;
- Well development and purge waters, unused PDB waters;
- Decontamination waters and associated solids;

Procedure:

1. Contain all investigation-derived wastes in Department of Transportation (DOT)-approved 55-gallon drums, roll-off boxes, or other containers suitable for the wastes.
2. Place different media in separate drums (i.e., do not combine solids and liquids). 3. To the extent practicable, separate solids from drilling muds, decontamination waters, and similar liquids. Place solids within separate containers.
4. Transfer all waste containers to a staging area. Access to this area will be controlled. Waste containers must be transferred to the staging area as soon as practicable after the generating activity is complete.
5. Label all containers with regard to contents, origin, and date of generation. Use indelible ink for all labeling.
6. Collect samples for waste characterization purposes, use boring/well sample analytical data for characterization.
7. For wastes determined to be hazardous in character, be aware on accumulation time limitations. Coordinate the disposal of these wastes with the Owner and NYSDEC.
8. Dispose of investigation-derived wastes as follows;
    - Soil, water, and other environmental media for which analysis does not detect organic constituents, and for which inorganic constituents are at levels consistent with background, may be spread on-site (pending NYSDEC approval) or otherwise treated as a non-waste material.
    - Soils, water, and other environmental media in which organic compounds are detected or metals are present above background will be disposed as industrial waste or hazardous waste, as appropriate. Alternate disposition must be consistent with applicable State and Federal laws.
    - Personal protective equipment, disposable bailers, and similar equipment may be disposed as municipal waste, unless waste characterization results mandate disposal as industrial wastes
9. If waste is determined to be listed hazardous waste, it must be handled as hazardous waste as described above, unless a contained-in determination is accepted by the NYSDEC.

10.0 Decontamination Procedures

Sampling methods and equipment have been chosen to minimize decontamination requirements and to prevent the possibility of cross-contamination. Decontamination of equipment will be

performed between discrete sampling locations. Equipment used to collect samples between composite sample locations will not require decontamination between collection of samples. All drilling equipment will be decontaminated after the completion of each drilling location. Special attention will be given to the drilling assembly and augers.

Split spoons and other non-disposable equipment will be decontaminated between each sampling location. The sampler will be cleaned prior to each use, by one of the following procedures:

- Initially cleaned of all foreign matter;
- Sanitized with a steam cleaner;

OR

- Initially cleaned of all foreign matter;
- Scrubbed with brushes in alconox solution;
- Triple rinsed; and
- Allowed to air dry.

Other sampling equipment including but not limited to low-flow sampling pumps, surface soil sampling trowel, water level meters, etc. will be decontaminated between sample location using an alconox solution. Consumables including gloves, tubing, bailers, string, etc. will be dedicated to one sample location and will not be reused.

11.0 Sample Containers

The containers required for sampling activities are pre-washed and ordered directly from a laboratory, which has the containers prepared in accordance with USEPA bottle washing procedures. The following tables detail sample volumes, containers, preservation and holding time for typical analytes.

Table 11-1
Groundwater Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Holding Time Until Extraction/ Analysis
VOCs	40-ml glass vial with Teflon-backed septum	Two (2); fill completely, no headspace	Cool to 4° C (ice in cooler), Hydrochloric acid to pH <2	14 days
Semi-volatile Organic Compounds (SVOCs)	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Pesticides	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Polychlorinated biphenyls (PCBs)	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Metals	250-ml HDPE	One (1); fill completely	Cool to 4° C (ice in cooler) Nitric acid to pH <2	180 days (28 for mercury)
Cyanide	1,000-mL HDPE		Cool to 4° C (ice in cooler) Nitric acid to pH <2	14 days

Note:
All sample bottles will be prepared in accordance with USEPA bottle washing procedures.
Consult with laboratory as bottleware may vary by laboratory.
Holding time begins at the time of sample collection.

TABLE 11-2
Soil Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Holding Time Until Extraction/ Analysis
VOCs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14 days
VOCs via EPA 5035	40 mL vials with sodium bisulfate, methanol, and/or DI water	Three (3), 5 grams each	Cool to 4° C (ice in cooler)	2 days
SVOCs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	7/40 days
PCBs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	7/40 days
Pesticides	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14/40 days
Metals	4-oz. glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	180 days (28 for mercury)
Cyanide	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14 days

Note:
All sample bottles will be prepared in accordance with USEPA bottle washing procedures.
Consult with laboratory as bottleware may vary by laboratory.
Holding time begins at the time of sample collection.

Table 11-3
Air Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Holding Time Until Extraction/ Analysis
VOCs	1 – Liter Summa® Canister	One (1) 1-Liter 1.4- Liter for MS/MSD	N/A	14 days

Note:
All sample bottles will be prepared in accordance with USEPA bottle washing procedures.
Consult with laboratory as bottleware may vary by laboratory.
Holding time begins at the time of sample collection.

12.0 Sample Custody and Shipment

12.1 Sample Identification

All containers of samples collected from the project will be identified using the following format on a label or tag fixed to the sample container:

AA-BB-CC-DD-EE

AA: This set of initials indicates an abbreviation for the Site from which the sample was collected.
BB This set of initials represents the type of sample (e.g., SB for soil boring and MW for monitoring well)
CC: These initials identify the unique sample location number.
DD: These initials identify the sample start depth (if soil sample)
EE These initials identify the sample end depth (if soil sample)

Each sample will be labeled, chemically preserved (if required) and sealed immediately after collection. To minimize handling of sample containers, labels will be filled out prior to sample collection when possible. The sample label will be filled out using waterproof ink and will be firmly affixed to the sample containers. The sample label will give the following information:

- Date and time of collection
- Sample identification
- Analysis required
- Project name/number
- Preservation

Sample tags attached to or affixed around the sample container must be used to properly identify all samples collected in the field. The sample tags are to be placed on the bottles so as not to obscure any QC lot numbers on the bottles; sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the logbook.

For chain-of-custody purposes, all QC samples are subject to exactly the same custodial procedures and documentation as "real" samples.

12.2 Chain of Custody

This section describes standard operating procedures for sample identification and chain-of-custody to be utilized for all field activities. The purpose of these procedures is to ensure that the quality of the samples is maintained during their collection, transportation, and storage through analysis. All chain-of-custody requirements comply with standard operating procedures indicated in USEPA sample handling protocol.

Sample identification documents must be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include:

- Field notebooks;
- Sample label; and
- Chain-of-custody records.

The primary objective of the chain-of-custody procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from collection to completion of all required analyses. A sample is in custody if it is:

- In someone's physical possession;
- In someone's view;
- Locked up; or
- Kept in a secured area that is restricted to authorized personnel.

As few persons as possible should handle samples. Sample bottles will be obtained pre-cleaned from the a laboratory. Sample containers should only be opened immediately prior to sample collection. The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under chain-of-custody rules. The sample collector will record sample data in the field notebook and/or field logs.

The chain-of-custody record must be fully completed in duplicate, using black carbon paper where possible, by the field technician who has been designated by the project manager as responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations, etc.), the person completing the chain-of-custody record should note these constraints on the chain of custody.

12.3 Transfer of Custody and Shipment

The coolers in which the samples are packed must be accompanied by a chain-of-custody record. When transferring samples, the individuals relinquishing and receiving them must sign, date, and note the time on the chain-of-custody record. This record documents sample custody transfer.

Shipping containers must be sealed with custody seals for shipment to the laboratory. The method of shipment, name of courier, and other pertinent information are entered on the chain-of-custody.

All shipments must be accompanied by the chain-of-custody record identifying their contents. The original record accompanies the shipment. The other copies are distributed appropriately to the site manager.

12.4 Custody Seals

Custody seals are preprinted adhesive-backed seals. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals must be signed and dated before shipment. On receipt at the laboratory, the custodian must check (and certify, by completing the package receipt log and LABMIS entries) that seals on boxes and bottles are intact. Strapping tape should be placed over the seals to ensure that seals are not accidentally broken during shipment.

12.5 Sample Packaging

Samples must be packaged carefully to avoid breakage or contamination and must be shipped to the laboratory at proper temperatures. The following sample packaging requirements will be followed:

- Sample bottle lids must never be mixed. All sample lids must stay with the original containers.
- The label should not cover any bottle preparation QC lot numbers.
- All sample bottles are placed in a plastic bag and/or individual bubble wrap sleeves to minimize the potential for cross-contamination and breaking.
- Shipping coolers must be partially filled with packing materials and ice when required, to prevent the bottles from moving during shipment.
- The sample bottles must be placed in the cooler in such a way as to ensure that they do not directly come in contact with other samples. Ice will be added to the cooler to ensure that the samples reach the laboratory at temperatures no greater than 4°C.
- Any remaining space in the cooler should be filled with inert packing material. Under no circumstances should material such as sawdust, sand, etc., be used.
- A chain of custody record must be placed in a plastic bag inside the cooler. Custody seals must be affixed to the sample cooler.

12.6 Sample Shipment

Shipping containers are to be custody-sealed for shipment as appropriate. The container custody seal will consist of tape wrapped around the package and custody seals affixed in such a way that access to the container can be gained only by cutting the filament tape and breaking the seal. Chain of custody seals shall be placed on the container, signed, and dated prior to taping the container to ensure the chain of custody seals will not be destroyed during shipment. In addition, the coolers must also be labeled and placarded in accordance with DOT regulations if shipping medium and high hazard samples.

Field personnel will make arrangements for transportation of samples to the lab. The lab must be notified as early as possible regarding samples intended for Saturday delivery. The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packaging, marking, labeling, and shipping hazardous materials are promulgated by the United States DOT in the Code of Federal Regulation, 49 CFR 171 through 177. All samples will be delivered to the laboratory and analyzed within the holding times specified by the analytical method for that particular analyte.

All chain-of-custody requirements must comply with standard operating procedures in the USEPA sample handling protocol.

12.7 Laboratory Custody Procedures

A designated sample custodian accepts custody of the shipped samples and verifies that the sample identification number matches that on the chain-of-custody record and traffic reports, if required. Pertinent information as to shipment, pickup, and courier is entered on the chain of custody or attached forms.

13.0 Deliverables

This section will describe laboratory requirement and procedures to be followed for laboratory analysis. Samples collected in New York State will be analyzed by a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory. When required, analyses will be conducted in accordance with the most current NYSDEC Analytical Services Protocol (ASP). For example, ASP Category B reports will be completed by the laboratory for samples representing the final delineation of the Remedial Investigation, confirmation samples, samples to determine closure of a system, and correlation samples taken using field testing technologies analyzed by an ELAP-certified laboratory to determine correlation to field results. Data Usability Summary Reports will be completed by a third party for samples requiring ASP Category B format reports. Electronic data deliverables (EDDs) will also be generated by the laboratory in EQUIS format for samples requiring ASP Category B format reports.

NYSDEC DER-10 DUSR requirements are as follows:

a) Background. The Data Usability Summary Report (DUSR) provides a thorough evaluation of analytical data with the primary objective to determine whether or not the data, as presented, meets the site/project specific criteria for data quality and data use.

    1. The development of the DUSR must be carried out by an experienced environmental scientists, such as the project Quality Assurance Officer, who is fully capable of conducting a full data validation. The DUSR is developed from:

        i. A DEC ASP Category B Data Deliverable; or

ii. The *USEPA Contract Laboratory Program National Functional Data Validation Standard Operating Procedures for Data Evaluation and Validation.*

2. The DUSR and the data deliverables package will be reviewed by DER staff. If full third party data validation is found to be necessary (e.g. pending litigation) this can be carried out at a later data on the same data package used for the development of the DUSR.

b) Personnel Requirements. The person preparing the DUSR must be pre-approved by DER. The person must submit their qualifications to DER documenting experience in analysis and data validation. Data validator qualifications are available on DEC's website identified in the table of contents.

c) Preparation of a DUSR. The DUSR is developed by reviewing and evaluating the analytical data package. In order for the DUSR to be acceptable, during the course of this review the following questions applicable to the analysis being reviewed must be answered in the affirmative.

1. Is the data package complete as defined under the requirements for the most current DEC ASP Category B or USEPA CLP data deliverables?
2. Have all holding times been met?
3. Do all the QC data; blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?
4. Have all of the data been generated using established and agreed upon analytical protocols?
5. Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?
6. Have the correct data qualifiers been used and are they consistent with the most current DEC ASP?
7. Have any quality control (QC) exceedances been specifically noted in the DUSR and have the corresponding QC summary sheets from the data package been attached to the DUSR?

d) Documenting the validation process in the DUSR. Once the data package has been reviewed and the above questions asked and answered the DUSR proceeds to describe the samples and the analytical parameters, including data deficiencies, analytical protocol deviations and quality control problems are identified and their effect on the data is discussed.

14.0 Equipment Calibration

All instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations as well as criteria set forth in the applicable analytical methodology references. Operation, calibration, and maintenance will be performed by personnel properly trained in these procedures. Section 11 lists the major instruments to be used for sampling and analysis. In addition, brief descriptions of calibration

procedures for major field and laboratory instruments follow.

14.1 Photovac/MiniRae Photoionization Detector (PID)

Standard operating procedures for the PID require that routine maintenance and calibration be performed every six months. Field calibration will be performed on a daily basis. The packages used for calibration are non-toxic analyzed gas mixtures available in pressurized containers. All calibration procedures will follow the manufacturer recommendations.

14.2 Conductance, Temperature, and pH Tester

Temperature and conductance instruments are factory calibrated. Temperature accuracy can be checked against an NBS certified thermometer prior to field use if necessary. Conductance accuracy may be checked with a solution of known conductance and recalibration can be instituted, if necessary.

14.3 0_2/Explosimeter

The specific meter used at the time of work shall be calibrated in accordance with manufacturer recommendations. The model 260 O_2/ Explosimeter is described below.

The primary maintenance item of the Model 260 is the rechargeable 2.4 volt (V) nickel cadmium battery. The battery is recharged by removing the screw cap covering receptacle and connecting one end of the charging cable to the instrument and the other end to a 115V AC outlet.

The battery can also be recharged using a 12V DC source. An accessory battery charging cable is available, one end of which plugs into the Model 260 while the other end is fitted with an automobile cigarette lighter plug.

Recommended charging time is 16 hours.

Before the calibration of the combustible gas indicator can be checked, the Model 260 must be in operating condition. Calibration check-adjustment is made as follows:

1. Attach the flow control to the recommended calibration gas tank.
2. Connect the adapter-hose to the flow control.
3. Open flow control valve.
4. Connect the adapter-hose fitting to the inlet of the instrument; after about 15 seconds the LEL meter pointer should be stable and within the range specified on the calibration sheet accompanying the calibration equipment. If the meter pointer is not in the correct range, stop the flow; remove the right hand side cover. Turn on the flow and adjust the "S" control with a small screwdriver to obtain a reading as specified on the calibration sheet.
5. Disconnect the adapter-hose fitting from the instrument.
6. Close the flow control valve.

7. Remove the adapter-hose from the flow control.
8. Remove the flow control from the calibration gas tank.
9. Replace the side cover on the Model 260.

CAUTION: Calibration gas tank contents are under pressure. Use no oil, grease, or flammable solvents on the flow control or the calibration gas tank. Do not store calibration gas tank near heat or fire or in rooms used for habitation. Do not throw in fire, incinerate, or puncture. Keep out of reach of children. It is illegal and hazardous to refill this tank. Do not attach the calibration gas tank to any other apparatus than described above. Do not attach any gas tank other than MSA calibration tanks to the regulator.

14.4 Nephelometer (Turbidity Meter)

LaMotte 2020WE Turbidity Meter is calibrated before each use. The default units are set to NTU and the default calibration curve is formazin. A 0 NTU Standard (Code 1480) is included with the meter. To calibrate, rinse a clean tube three times with the blank. Fill the tube to the fill line with the blank. Insert the tube into the chamber, close the lid, and select "scan blank".

TABLE 14-4
List of Major Instruments
for Sampling and Analysis

- MSA 360 0_2 /Explosimeter
- Geotech Geopump II AC/DC Peristaltic Pump
- QED MP50 Controller and QED Sample Pro MicroPurge Bladder Pimp
- Horiba U-53 Multi-Parameter Water Quality Meter
- LaMotte 2020WE Turbidity Meter
- EM-31 Geomics Electromagnetic Induction Device
- Mini Rae Photoionization Detectors (3,000, ppbRAE, etc.)

15.0 Internal Quality Control Checks

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of field equipment. Field-based QC will comprise at least 10% of each data set generated and will consist of standards, replicates, spikes, and blanks. Field duplicates and field blanks will be analyzed by the laboratory as samples and will not necessarily be identified to the laboratory as duplicates or blanks. For each matrix, field duplicates will be provided at a rate of one per 10 samples collected or one per shipment, whichever is greater. Field blanks which may consist of trip, routine field, and/or rinsate blanks will be provided at a rate of one per 20

samples collected for each media, or one per shipment, whichever is greater. Frequency of QC data may vary from project to project; refer to the project-specific work plan for QC requirements.

Calculations will be performed for recoveries and standard deviations along with review of retention times, response factors, chromatograms, calibration, tuning, and all other QC information generated. All QC data, including split samples, will be documented in the site logbook and/or appropriate field logs. QC records will be retained and results reported with sample data.

15.1 Field Blanks

Various types of blanks are used to check the cleanliness of field handling methods. The following types of blanks may be used: the trip blank, the routine field blank, and the field equipment blank. They are analyzed in the laboratory as samples, and their purpose is to assess the sampling and transport procedures as possible sources of sample contamination. Field staff may add blanks if field circumstances are such that they consider normal procedures are not sufficient to prevent or control sample contamination, or at the direction of the project manager. Rigorous documentation of all blanks in the site logbooks is mandatory.

- **Routine Field Blanks** or bottle blanks are blank samples prepared in the field to access ambient field conditions. They will be prepared by filling empty sample containers with deionized water and any necessary preservatives. They will be handled like a sample and shipped to the laboratory for analysis.
- **Trip Blanks** are similar to routine field blanks with the exception that they are **not** exposed to field conditions. Their analytical results give the overall level of contamination from everything except ambient field conditions. For the RI/FS, one trip blank will be collected with every shipment of water samples for VOC analysis. Each trip blank will be prepared by filling a 40-ml vial with deionized water prior to the sampling trip, transported to the site, handled like a sample, and returned to the laboratory for analysis without being opened in the field. Trip blanks may be provided by the laboratory, shipped with the bottleware, and kept with the sampling containers until analysis.
- **Field Equipment Blanks** are blank samples (sometimes called transfer blanks or rinsate blanks) designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use, and that cleaning procedures between samples are sufficient to minimize cross contamination. If a sampling team is familiar with a particular site, they may be able to predict which areas or samples are likely to have the highest concentration of contaminants. Unless other constraints apply, these samples should be taken last to avoid excessive contamination of sampling equipment.

15.2 Duplicates

Duplicate samples are collected to check the consistency of sampling and analysis procedures. The following types of duplicates may be collected.

- **Blind duplicate** samples consist of a set of two samples collected independently at a sampling location during a single sampling event. Blind duplicates are designed to assess the consistency of the overall sampling and analytical system. Blind duplicate samples

should not be distinguishable by the person performing the analysis.

- **Matrix Spike and Matrix Spike Duplicates (MS/MSDs)** consist of a set of three samples collected independently at a sampling location during a single sampling event. These samples are for laboratory quality control checks.