

**MODIFIED CORRECTIVE ACTION PLAN  
(COST PROPOSAL NO. 26)**

**HIGHWAY 46 FUEL CENTER, INC.  
HIGHWAY 46 FUEL CENTER  
6658 HIGHWAY 46  
HEFLIN, ALABAMA**

**FACILITY I.D. NO. 23013-029-011676  
INCIDENT NO. UST18-10-07**

**PPM PROJECT NO. 455401-MCAP**

**MAY 9, 2024**



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(COST PROPOSAL NO. 26)**

**FOR**

**HIGHWAY 46 FUEL CENTER  
6658 HIGHWAY 46  
HEFLIN, ALABAMA**

**FACILITY I.D. NO. 23013-029-011676  
INCIDENT NO. UST18-10-07**

**PREPARED FOR:**

**HIGHWAY 46 FUEL CENTER, INC.  
11681 COUNTY ROAD 66  
HEFLIN, ALABAMA 36264**

**PPM PROJECT NO. 455401-MCAP**

**MAY 9, 2024**

**PREPARED BY:**



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**MATTHEW J. EBBERT, P.G.  
SENIOR GEOLOGIST**

**REVIEWED BY:**



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**DEREK PRINCE, P.G.  
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## CERTIFICATION PAGE

*I certify under penalty of law that this Modified Corrective Action Plan for the Highway 46 Fuel Center facility located at the intersection of Highway 46 and Interstate 20 in Heflin, Alabama, and the plans, specifications, and technical data submitted within were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiring of the person or persons who directly gathered the enclosed information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information.*



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Michael L. Ellison, P.E.  
AL No. 23757

05/09/24

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Date

# UST RELEASE FACT SHEET

**GENERAL INFORMATION:**

SITE NAME: Highway 46 Fuel Center

ADDRESS: 6658 Highway 46, Heflin, Alabama

FACILITY I.D. NO.: 23013-029-011676

INCIDENT NO.: UST18-10-07

**RESULTS OF EXPOSURE ASSESSMENT:**

How many private drinking water wells are located within 1,000 ft. of site?	0
How many public water supply wells are located within 1 mile of the site?	0
Have any drinking water supply wells been impacted by contamination from this release?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is there an imminent threat of contamination to any drinking water wells?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Have vapors or contaminated groundwater posed a threat to the public?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are any underground utilities impacted or imminently threatened by the release?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Have surface waters been impacted by the release?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is there an imminent threat of contamination to surface waters?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
What is the type of surrounding population?	Commercial/Residential

**CONTAMINATION DESCRIPTION:**

Type of contamination at site:  Gasoline,  Diesel,  Waste Oil  Kerosene,  Other   

Free product present in wells?  Yes  No

Maximum BTEX or PAH concentration measured in soil:	Benzene <0.005 mg/kg (All borings) BTEX BDL (All borings) MTBE 0.282 mg/kg (SB-3-29-31) Naph <0.025 mg/kg (All borings)
-----------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------

Current maximum COC concentrations measured in groundwater: (12/11/23)	Benzene: 0.886 mg/L (MW-3) BTEX: 1.411 mg/L (MW-3) MTBE: 2.120 mg/L (RW-2) Naphthalene: 0.053 mg/L (MW-3)
---------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------

## ADEM GROUNDWATER BRANCH UST SITE CLASSIFICATION SYSTEM CHECKLIST

Please read all of the following statements and mark either yes or no if the statement applies to your site. If you have conducted a Preliminary or Secondary Investigation, all questions should be answered. Closure site assessment reports may not provide you with all the necessary information, but answer the statements with the knowledge obtained during the closure site assessment.

SITE NAME: Highway 46 Fuel Center  
 SITE ADDRESS: 6658 Highway 46, Heflin, Alabama

FACILITY I.D. NO.: 23013-029-011676  
 INCIDENT NO.: UST18-10-07

OWNER NAME: Highway 46 Fuel Center, Inc.  
 OWNER ADDRESS: 11681 County Road 66, Heflin, Alabama 36264

NAME & ADDRESS OF PERSON COMPLETING THIS FORM: Matthew J. Ebbert, P.G., PPM Consultants, Inc.  
5555 Bankhead Highway, Birmingham, Alabama 35210

<i>CLASSIFICATION</i>	<i>DESCRIPTION</i>	<i>YES</i>	<i>NO</i>
<b>CLASS A</b>	<b>IMMEDIATE THREAT TO HUMAN HEALTH, HUMAN SAFETY OR SENSITIVE ENVIRONMENTAL RECEPTOR</b>		
A.1	Vapor concentrations at or approaching explosive levels that could cause health effects, are present in a residence or building.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A.2	Vapor concentrations at or approaching explosive levels are present in subsurface utility system(s), but no buildings or residences are impacted.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>CLASS B</b>	<b>IMMEDIATE THREAT TO HUMAN HEALTH, HUMAN SAFETY OR SENSITIVE ENVIRONMENTAL RECEPTOR</b>		
B.1	An active public water supply well, public water supply line, or public surface water intake is impacted or immediately threatened.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B.2	An active domestic water supply well, domestic water supply line or domestic surface water intake is impacted or immediately threatened.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B.3	The release is located within a designated Wellhead Protection Area I.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>CLASS C</b>	<b>IMMEDIATE THREAT TO HUMAN HEALTH, HUMAN SAFETY OR SENSITIVE ENVIRONMENTAL RECEPTOR</b>		
C.1	Ambient vapor/particulate concentrations exceed concentrations of concern from an acute exposure, or safety viewpoint.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
C.2	Free product is present on the groundwater, at ground surface, on surface water bodies, in utilities other than water supply lines, or in surface water runoff.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>CLASS D</b>	<b>SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS</b>		
D.1	There is a potential for explosive levels, or concentrations of vapors that could cause acute effects, to accumulate in a residence or other building.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
D.2	A non-potable water supply well is impacted or immediately threatened.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
D.3	Shallow contaminated surface soils are open to public access, and dwellings, parks, playgrounds, day care centers, schools or similar use facilities are within 500 feet of those soils.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**ADEM GROUNDWATER BRANCH  
UST SITE CLASSIFICATION SYSTEM  
CHECKLIST (continued)**

<i>CLASSIFICATION</i>	<i>DESCRIPTION</i>	<i>YES</i>	<i>NO</i>
CLASS E	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
E.1	A sensitive habitat or sensitive resources (sport fish, economically important species, threatened and endangered species, etc.) are impacted and affected.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CLASS F	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
F.1	Groundwater is impacted and a public well is located within 1 mile of the site.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F.2	Groundwater is impacted and a domestic well is located within 1,000 feet of the site.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F.3	Contaminated soils and/or groundwater are located within designated Wellhead Protection Areas (Areas II or III).	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CLASS G	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
G.1	Contaminated soils and/or groundwater are located within areas vulnerable to contamination from surface sources.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CLASS H	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
H.1	Impacted surface water, stormwater or groundwater discharges within 500 feet of a surface water body used for human drinking water, whole body water-contact sports, or habitat to a protected or listed endangered plant and animal species.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CLASS I	LONG TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
I.1	Site has contaminated soils and/or groundwater but does not meet any of the above-mentioned criteria.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**ADDITIONAL COMMENTS:**

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**Complete the classification evaluation questions listed above. Upon completion, determine the highest rank of the site (A.1 is the highest rank) based on the statements answered with a yes.**

Enter the determined classification ranking:	<b>G.1</b>
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ADEM GROUNDWATER BRANCH  
SITE CLASSIFICATION CHECKLIST  
(5/8/95)

## 1.0 INTRODUCTION

PPM Consultants, Inc. (PPM) was retained by the Highway 46 Fuel Center, Inc. to prepare a Modified Corrective Action Plan (MCAP) for the Highway 46 Fuel Center facility located at the intersection of Highway 46 and Interstate 20 in Heflin, Cleburne County, Alabama. The Alabama Department of Environmental Management (ADEM) requested this work in correspondence dated February 1, 2024, via approval of Cost Proposal No. 26.

The purpose of the MCAP is to develop a remedial approach to reduce constituent-of-concern (COC) concentrations in groundwater to below Site-Specific Corrective Action Levels (SSCALs). As discussed with ADEM, the selected remedial technology for this MCAP is injection of PetroFix<sup>®</sup> and Oxygen Release Compound-Advanced (ORC-A). COCs for the site include benzene, toluene, ethylbenzene, and total xylenes (BTEX), methyl tertiary butyl ether (MTBE), and naphthalene.

Prior corrective actions at the site have consisted of monthly 8-hour mobile enhanced multi-phase extraction (MEME) events and remediation by natural attenuation (RNA) monitoring intended to address COC impact in soil and groundwater. Although reductions in dissolved COC concentrations were observed over time, additional corrective actions are necessary to achieve site objectives in a more-timely manner.

## 2.0 SITE BACKGROUND

### 2.1 SITE LOCATION

The Highway 46 Fuel Center facility is currently a retail petroleum station located at 6658 Highway 46 in Heflin, Alabama. The site is situated in the northwest  $\frac{1}{4}$  of the southeast  $\frac{1}{4}$  of Section 8, Township 16 South, Range 11 East of the Heflin, Alabama Quadrangle. More specifically, the site is positioned at 33°38'46" north latitude and 85°30'22" west longitude. The site location is shown in **Figure 1, Site Location Map in Figures**.

### 2.2 SURROUNDING AREA

The property is located west of the intersection of Highway 46 and Interstate 20 in a residential, commercial, and agricultural area of Heflin, Alabama. The adjacent parcel to the northwest is residential and another residence is located to the southeast, across Interstate 20. The adjacent parcels to the southwest are Smith Farms store and ABC Select Spirits. Adjacent to the east, across Interstate 20, is a Shell service station. The remaining

adjacent parcels are vacant. Adjacent and surrounding properties are shown in **Figure 2, Area Map**.

## 2.3 SITE DESCRIPTION

The topography of the site is relatively flat, gradually sloping to the southwest. Structures at the site include two canopies northeast and southwest of the store building; four gasoline dispenser islands; four diesel dispenser islands; one off-road diesel dispenser; two 8,000-gallon gasoline single-wall steel underground storage tanks (USTs), one 8,000-gallon off-road diesel single-wall steel UST, one 20,000-gallon diesel single-wall steel UST, and associated product transfer piping. The three 8,000-gallon USTs are located within a single tank pit located adjacent to the southeastern side of the store building. The product piping extends from the tank pit to the four dispensers northwest of the USTs. The off-road diesel dispenser is located adjacent to the UST pit next to the store building. The 20,000-gallon diesel UST is located in a tank pit southwest of the diesel dispensers. Additionally, a fireworks store and a tire shop are located on the eastern side of the property.

Underground utilities identified at the site include sanitary sewer, water, fiber optic, and underground electric. Overhead electrical and communication lines are also present at the site. The fiber optic and underground electric lines traverse southeast to northwest toward the southern corner of the store building. The sanitary sewer line traverses west-northwest from the western corner of the building. The water line is located on the eastern corner of the property traversing northwest to southeast and then northeast to southwest. Site features and approximate utility locations are shown in **Figure 3, Site Map**.

## 2.4 SITE HISTORY

The following provides a brief summary of pertinent activities conducted at the site to date.

***Environmental Assessment:*** On September 20, 2017, Logic Environmental performed a groundwater investigation at the site. Three soil borings (B-1 through B-3) were installed using direct-push technology. Groundwater samples were collected from each of the soil borings and analyzed for BTEX constituents. Dissolved benzene concentrations exceeded the ADEM Initial Screening Level (ISL) in the samples collected from B-1 (near the three 8,000-gallon USTs) and B-3 (near the gasoline dispensers). Additionally, the toluene concentration in the sample collected from B-3 also exceeded the ADEM ISL.

Logic Environmental submitted a UST Release Report to ADEM on October 2, 2017, and ADEM issued a Notice of Requirement to Conduct Investigative and Corrective Actions on November 21, 2017.

***Preliminary Investigation:*** PPM conducted a Preliminary Investigation at the site in January 2018. Four soil borings/monitoring wells (SB-1/MW-1 through SB-4/MW-4) were installed in proximity of the UST system. The soil samples collected from the soil borings did not contain COC concentrations above ADEM ISLs, with the exception of the MTBE concentration [0.282 milligrams per liter (mg/L)] from the 29 to 31-foot interval in SB-3.

Free product was not observed on the groundwater surface within monitoring wells MW-1 through MW-4. Dissolved COC concentrations exceeded the ADEM ISLs in monitoring wells MW-1 through MW-4 and were not delineated at the site. Based on these findings, PPM recommended that a Secondary Investigation be completed at the site.

***Secondary Investigation:*** PPM completed a Secondary Investigation at the site in November and December 2018. Eight soil borings/monitoring wells (SB-5/MW-5 through SB-12/MW-12) were installed. Analytical results indicated COC concentrations in soil were below detection limits (BDL) for all samples. The onsite domestic well was abandoned during drilling activities.

Free product was not observed in any of the monitoring wells. Dissolved COC impact above the ADEM ISLs was detected in MW-1 through MW-5. The horizontal extent of dissolved COC impact is not delineated to the northwest.

***Alabama Risk-Based Corrective Action Evaluation (ARBCA):*** An ARBCA Evaluation was submitted to ADEM on June 28, 2019. COC concentrations in soil and groundwater did not exceed Tier II site-specific target levels (SSTLs) for an on-site or off-site receptor. Additionally, COC concentrations in soil at the source did not exceed allowable Tier II groundwater resource protection (GRP) values. However, the representative benzene and MTBE concentrations in groundwater at source well MW-3 exceed the proposed GRP values. The SSCALs were approved by ADEM in correspondence dated July 17, 2019.

***Corrective Action Plan (CAP) Evaluation:*** In correspondence dated April 5, 2019, ADEM requested evaluation of corrective action alternatives for the site. PPM conducted a CAP evaluation and recommended periodic RNA groundwater monitoring and MEME events as the most efficient and economical remedial approach for the site to reduce COC

impact in soil and groundwater in a timely and efficient manner. PPM submitted the evaluation to ADEM on June 28, 2019.

**Groundwater Monitoring:** Sampling events were performed on June 6, 2019; September 6, 2019; December 16, 2019; and March 12, 2020. The general direction of groundwater flow was to the north. Free product was not observed in any of the monitoring wells that were measured. Dissolved COC concentrations exceeded the SSCALs in MW-3 and MW-6 in June and September, and in MW-3 in December and March. Delineation was not complete to the northwest.

**CAP Development:** In correspondence dated July 17, 2019, ADEM requested development of a CAP utilizing RNA monitoring with MEME events and recovery well installation. PPM submitted the CAP to ADEM on December 23, 2019. ADEM issued authorization to implement the CAP in correspondence dated April 30, 2020.

**Recovery Well and Manifold Installation:** Three 4-inch inside diameter (I.D.) recovery wells (RW-1 through RW-3) were installed at the site in July 2020. Additionally, a centralized manifold was installed for the purpose of extracting from the recovery wells during MEME events. A comprehensive groundwater sampling event was conducted on August 5, 2020. Dissolved COC concentrations exceeded the SSCALs in MW-3 and RW-2. During the August 2020 MEME event, an estimated 1.63 pounds (0.26 equivalent gallons) of hydrocarbons were removed from the site.

**RNA Monitoring:** A comprehensive groundwater sampling event was conducted at the site on November 4, 2020. Dissolved benzene and MTBE concentrations exceeded the SSCALs in MW-3. During the November 2020 MEME event, an estimated 1.47 pounds (0.24 equivalent gallons) of hydrocarbons were removed from the site.

A comprehensive groundwater sampling event was conducted at the site on February 12, 2021. Dissolved benzene and MTBE concentrations continued to exceed the SSCALs in MW-3. During the February 2021 MEME event, an estimated 1.55 pounds (0.25 equivalent gallons) of hydrocarbons were removed from the site.

A comprehensive groundwater sampling event was conducted on May 5, 2021. Dissolved benzene and MTBE concentrations continued to exceed the SSCALs in MW-3. During the May 2021 MEME event, an estimated 2.56 pounds (0.42 equivalent gallons) of hydrocarbons were removed from the site.



A comprehensive groundwater sampling event was conducted on August 3, 2021. Dissolved benzene and MTBE concentrations continued to exceed the SSCALs in MW-3, and the dissolved benzene concentration in RW-2 increased above the SSCAL. During the August 2021 MEME event, an estimated 9.30 pounds (1.51 equivalent gallons) of hydrocarbons were removed from the site.

A comprehensive groundwater sampling event was conducted on November 15, 2021. Dissolved benzene concentrations continued to exceed the SSCALs in MW-3 and RW-2, and the dissolved MTBE concentration in RW-2 remained above the SSCAL. However, the MTBE concentration in MW-3 decreased below the SSCAL. During the November 2021 MEME event, an estimated 21.22 pounds (3.44 equivalent gallons) of hydrocarbons were removed from the site.

A comprehensive groundwater sampling event was conducted on May 2, 2022. The dissolved benzene and MTBE concentrations exceeded the SSCALs in MW-3 and RW-2. During the May 2022 MEME event, an estimated 19.0 pounds (3.1 equivalent gallons) of hydrocarbons were removed from the site.

Three 8-hour MEME events were conducted at the site in July 2022, August 2022, and September 2022, and a groundwater sampling event was completed at the site on September 19, 2022. An estimated 62.7 pounds (10.2 equivalent gallons) of hydrocarbons were removed from the site. The dissolved benzene and MTBE concentrations exceeded the SSCALs in MW-3 and RW-2.

Three 8-hour MEME events were conducted at the site in October 2022, November 2022, and December 2022, and a groundwater sampling event was completed at the site on December 13, 2022. An estimated 74.0 pounds (12.0 equivalent gallons) of hydrocarbons were removed from the site. The dissolved benzene and MTBE concentrations exceeded the SSCALs in MW-3 and RW-2.

Two 8-hour MEME events were conducted at the site in February 2023 and March 2023, and a groundwater sampling event was completed at the site on March 15, 2023. An estimated 34.1 pounds (5.5 equivalent gallons) of hydrocarbons were removed from the site. The dissolved benzene and MTBE concentrations exceeded the SSCALs in MW-3 and RW-2.

Three 8-hour MEME events were conducted at the site in July 2023, August 2023, and September 2023, and a groundwater sampling event was completed at the site on

September 11, 2023. An estimated 29.3 pounds (4.7 equivalent gallons) of hydrocarbons were removed from the site during the period. Dissolved COC concentrations exceeded the SSCALs in MW-3 and RW-2.

Three 8-hour MEME events were conducted at the site in October 2023, November 2023, and December 2023, and a groundwater sampling event was completed at the site on December 11, 2023. An estimated 76.4 pounds (12.4 equivalent gallons) of hydrocarbons were removed from the site during the current period. Dissolved COC concentrations exceeded the SSCALs in MW-3 and RW-2 and have remained relatively stable for approximately two years. Based on this, PPM recommended that an MCAP be prepared to develop a more effective remedial approach for the site. ADEM agreed with this recommendation.

## 2.5 SITE CONDITIONS

### 2.5.1 Soil

Subsurface geology was identified from visual inspection of soils encountered during advancement of the soil borings. The soil at the site is primarily composed of clay, silty clay, sandy clay, gravelly clay, silt, weathered phyllite, and phyllite from the surface to boring termination. Silt was observed in each of the borings from ground surface to depths of approximately 4 feet below ground surface (BGS), followed by alternating layers silt with weathered phyllite and phyllite to depths of approximately 50 feet BGS or boring termination. Auger refusal was not encountered in any of the borings prior to boring termination with the exception of Type III well MW-5 (SB-5) where auger refusal was encountered at approximately 55 feet BGS. In boring SB-5, phyllite with quartz was observed at approximately 40 feet BGS and continued to boring termination (75 feet BGS). Soil borings and monitoring well construction logs from prior site investigations are provided in **Appendix A, Soil Boring/Monitoring Well Construction Logs**. Lithology is also depicted on **Figure 4, Geologic Cross-Section A-A'**.

### 2.5.2 COCs in Soil

Soil data collected during prior investigations indicates that COC impact is limited to the area between the northern UST pit and gasoline dispensers. One soil sample contained a detectable concentration of MTBE below the SSCAL. The remaining soil samples did not contain detectable COC concentrations. The COC impact identified has been defined horizontally in all directions.

A summary of this data is presented in **Table 1, Soil Analytical Summary, Tables**. In addition, **Figure 5, COC Concentrations in Soil** illustrates areas COC concentrations measured across the site.

### 2.5.3 Groundwater

During the Preliminary Investigation, the initial zone of saturation was encountered at approximately 36 feet BGS in soil boring SB-1. Initial saturation was not encountered in SB-2, SB-3, or SB-4. During the Secondary Investigation, the initial zone of saturation was encountered at approximately 38 to 39 feet BGS in soil borings SB-5 and SB-9 through SB-12. Initial saturation was not encountered in the other borings.

Groundwater levels measured in the monitoring wells on December 11, 2023, ranged from 30.72 feet below top of casing (BTOC) at monitoring well MW-11 to 35.16 feet BTOC at monitoring well MW-1. Based on these groundwater level measurements, groundwater flow is to the northwest. The hydraulic gradient between recovery well RW-2 and monitoring well MW-8 was estimated to be 0.017 feet/foot (ft/ft). This is relatively consistent with historical groundwater flow maps. Groundwater elevation data are shown in **Table 2, Groundwater Elevation Survey Data. Figure 6, Groundwater Elevation Map (December 11, 2023)** depicts the groundwater flow direction and potentiometric surface.

### 2.5.4 COCs in Groundwater

No measurable free product was encountered in any monitoring wells sampled on December 11, 2023. The dissolved benzene concentration in monitoring well MW-3 and the dissolved MTBE concentration in recovery well RW-2 exceeded the SSCALs. Dissolved COC concentrations have been relatively stable in these two wells since November 2021. The dissolved MTBE concentration in MW-3 decreased below the SSCAL since the previous sampling event conducted in September 2023. Additionally, the dissolved benzene concentration in RW-2 remained below the SSCAL for the second consecutive quarter; however, this is common for RW-2 during the dry season. To achieve site objectives in a timely manner, additional remedial actions are needed to bring the site to closure.

Groundwater analytical results are summarized in **Table 3, Groundwater Analytical Summary**. The analytical results for dissolved benzene, MTBE, and naphthalene are provided in **Figure 7, Dissolved Benzene Isoconcentration Map (December 11, 2023)**;

**Figure 8, Dissolved MTBE Isoconcentration Map (December 11, 2023); and Figure 9, Dissolved Naphthalene Isoconcentration Map (December 11, 2023).**

### 2.5.5 Intrinsic Groundwater Parameters

Water quality parameters in the shallow monitoring wells exhibited the following ranges during the December 11, 2023, groundwater sampling event:

- pH: 3.91 standard units (S.U.) to 5.92 S.U.
- Temperature: 17.0 degrees Celsius ( $^{\circ}\text{C}$ ) to 19.8  $^{\circ}\text{C}$
- Conductivity: 20 micro Siemens per centimeter ( $\mu\text{S}/\text{cm}$ ) to 200  $\mu\text{S}/\text{cm}$
- ORP: 108.9 millivolts (mV) to 340.4 mV.

Dissolved oxygen could not be measured due to a meter malfunction. Dissolved oxygen concentrations during the September 11, 2023, sampling event ranged from 1.03 mg/L to 7.47 mg/L. Findings for water quality parameters are reported in **Table 4, Intrinsic Groundwater Parameters**.

## 3.0 REMEDIAL OBJECTIVES

This MCAP has been prepared to achieve the following objectives:

- Reduce the potential for further migration of dissolved COCs
- Reduce COC concentrations in groundwater to below SSCALs
- Accomplish site objectives in a safe, timely, and cost-effective manner.

## 4.0 REMEDIAL APPROACH

The following provides a detailed description of the remedial approach to be employed to meet the remedial goals.

### 4.1 TECHNOLOGY DESCRIPTION

Per Regensis, PetroFix<sup>®</sup> is an activated carbon slurry composed of very fine particles [1 to 2 micrometers ( $\mu\text{m}$ )] suspended in water through the use of unique organic polymer dispersion chemistry. Once injected into groundwater, the material behaves as a colloidal

biomatrix binding to the aquifer soil matrix. Once dissolved contaminants are sorbed onto the activated carbon matrix, biodegradation processes achieve complete remediation at an accelerated rate. Per Regenesis, PetroFix<sup>®</sup>, which is derived from the Regenesis product PlumeStop<sup>™</sup>, operates through a four-step process:

- 1) **Dispersion within the Subsurface:** PetroFix<sup>®</sup> is applied into the subsurface through gravity-feed or low-pressure injection and evenly distributes through a much larger area than injection of powdered activated carbon.
- 2) **Rapid Sorption of Dissolved-Phase Contaminants:** After injection, target contaminants preferentially partition out of the aqueous phase and sorb onto the liquid activated carbon matrix, thereby removing the contaminants from the groundwater. Concentration of the contaminants in this manner, in a matrix conducive to biological degrader colonization and activity, results in a direct increase in the overall rate of contaminant destruction.
- 3) **Biodegradation of Contaminants within the Matrix:** Once in place and with contaminants partitioned onto its surface, PetroFix<sup>®</sup> particles are colonized by contaminant-degrading bacteria. The net result is a substantial increase in the rate and extent of contaminant destruction. Calcium sulfate dihydrate additives increase the size of the bacterial colony through enhanced respiration and growth.
- 4) **Regeneration of Sorption Sites for Long-Term Treatment:** Enhanced biodegradation of contaminants within the biomatrix regenerates or frees up sorption sites allowing contaminants to further partition out of the groundwater. This allows a single application of PetroFix<sup>®</sup> to remain functional for an extended/ indefinite period of time.

ORC Advanced<sup>®</sup> is a single part, engineered oxygen release compound designed specifically for enhanced, in situ aerobic bioremediation. ORC Advanced<sup>®</sup> can be applied by direct push injection, remediation well injection and into open excavations. Regenesis proposes to inject ORC Advanced<sup>®</sup> at 28 locations to assist with the degradation of MTBE. The application of ORC Advanced<sup>®</sup> should aid in the natural attenuation of the remaining COC mass.

## 4.2 UNDERGROUND INJECTION CONTROL PERMIT

A UIC permit will be obtained from ADEM upon approval of this MCAP. ADEM evaluates UIC permits on an individual basis to determine a list of analytes required to be monitored in regard to the UIC permit. PPM anticipates that at a minimum, ADEM will require monitoring of nitrate, sulfate, and pH during the baseline groundwater monitoring

event and on a quarterly basis for at least one year. However, ADEM may also require monitoring for ammonia, calcium, sodium, and total dissolved solids (TDS).

ADEM requires the submittal of a report within 30 days of the injection activities that details the work performed, the amount of solution injected, and depicts the injection field.

### **4.3 BASELINE GROUNDWATER SAMPLING**

A baseline groundwater monitoring event will be conducted at the site prior to injection of PetroFix<sup>®</sup> and ORC Advanced<sup>®</sup>, under a previously approved cost proposal. The following provides a detailed description of the fieldwork methodology for the baseline event and subsequent effectiveness monitoring events.

A groundwater elevation survey will be performed prior to sampling the wells. Depth to groundwater measurements will be accomplished at each well location to be sampled with an oil/water interface probe capable of measuring the water depth to within +/- 0.01 feet. The interface probe will be cleaned prior to use at each well location by means of a phosphate free soap rinse, an isopropyl rinse, and a rinse of distilled water. Rinse fluids will be discharged to the land surface in areas that do not drain back to the respective well locations.

Select monitoring wells will then be sampled in general accordance with PPM's internal Quality Assurance/Quality Control (QA/QC) plan. Prior to sampling, each monitoring well will be purged of approximately three well-casing volumes (or to near dryness) utilizing single use, disposable polyvinyl chloride (PVC) bailers and nylon rope. Purge water generated during the quarterly sampling events will be transported and temporarily staged at the PPM office in Birmingham, Alabama, until it can be picked up by HEPACO for disposal at the Sunoco LP facility in Birmingham, Alabama.

Each sample for COC analysis will be transferred from the bailer into 40-milliliter (mL) glass vials containing hydrochloric acid (HCl) as a preservative. Each container will be filled with the sample, promptly capped, and appropriately labeled to indicate the sample origin. A duplicate sample from one well will be collected for QA/QC protocol. Containers will then be placed in an iced cooler for preservation during shipment to the laboratory.

PPM personnel will wear disposable nitrile gloves during well purge and sample collection activities in an effort to reduce the potential for cross-contamination and as part of personal

protective equipment (PPE) for the project. Gloves will be changed and discarded between each sample acquisition.

Upon completion of sampling activities, sample coolers will be transported or shipped under standard chain-of-custody protocol to an independent testing laboratory for analyses.

#### 4.4 INJECTION PLAN

Applicable state and local permits will be obtained prior to injection activities. Based on site information provided by PPM, Regensis prepared an application design consisting of injection of PetroFix<sup>®</sup> through a grid of 40 injection points (IPs) and injection of ORC Advanced<sup>®</sup> (ORC-A) through a grid of 28 points. The grids are in the vicinity of MW-3 and RW-2, located southeast of the dispenser islands and north of the UST pit. Regensis estimates the IPs will have a radius of influence of 6 feet and were strategically placed to treat source area groundwater. The proposed injection area is shown as an orange rectangle on Figure 1 – Treatment Area Map included in the **Regensis Design** provided in **Appendix B**.

At each IP, a hollow, steel probe with horizontal jet nozzles near the tip will be advanced to a total depth of approximately 27 feet BGS. Injection will take place through the tip as the probe is advanced at 2-ft intervals, delivering a uniform distribution of treatment chemicals across the 27 to 40-foot BGS intervals at each IP location. Following injection, the probe will be fully retracted from the subsurface, and the borehole will be filled with bentonite to near ground surface and patched with asphalt or sand, depending on the IP location.

The Regensis design includes injection of PetroFix<sup>®</sup> with water includes 7,638 gallons. The design also includes the injection of ORC-A with water for a total mixture of 234 gallons. Regensis will retain the drilling contractor to perform the injections. However, PPM is responsible for:

- Procuring a forklift for the duration of the injection activities
- Accepting delivery and storage (in a dry area) of approximately 5,200 pounds PetroFix<sup>®</sup> and 720 pounds of ORC-A
- Contracting with a GPR survey provider to identify subsurface utilities and piping in the injection area
- Providing water for mixing the PetroFix<sup>®</sup> and ORC-A
- Proper disposal of totes, pallets, bags, etc. from the injections



- Providing a water quality meter similar to a YSI 556 with a down-hole sensor (cable length of at least 50 feet)
- Procuring traffic control barriers for the duration of the injection activities.

#### 4.5 MATERIAL HANDLING

PetroFix<sup>®</sup> and ORC-A were developed to be very stable. Even so, all reagents will be properly stored and proper PPE will be used when mixing and handling the product as directed by the Safety Data Sheets (SDSs). Copies of the SDS for PetroFix<sup>®</sup> and ORC-A are included in **Appendix C, SDSs**.

#### 4.6 MONITORING

PPM will collect groundwater samples from each of the monitoring wells and the recovery wells during the baseline and subsequent quarterly groundwater sampling events to monitor the effectiveness of the remediation at reducing dissolved COC concentrations. Groundwater samples will be analyzed for BTEX, MTBE, and naphthalene per Environmental Protection Agency (EPA) Method 8260. In addition, select wells, as specified by the UIC permit will be analyzed for UIC parameters.

#### 4.7 SITE HEALTH AND SAFETY

A site-specific Health and Safety Plan (HASP) was developed for corrective action efforts at the facility is included in **Appendix D, Site-Specific Health and Safety Plan**. The HASP was specifically designed to address the corrective actions and monitoring activities at the site. PPM project personnel are familiar with the HASP prior to performing any work at the site. The HASP will be kept on site throughout the duration of the project.

The HASP will be specifically designed to address each aspect of remediation activities to be performed and will incorporate the safety provisions of the SDS. The injection area will be partitioned with caution tape and/or temporary fencing to prevent public access to the injection area.

### 5.0 REPORTING

PPM will submit a MCAP Implementation Report to ADEM within 30 days of completion of the injection activities. The report will summarize field activities.



## 6.0 PROJECT SCHEDULE

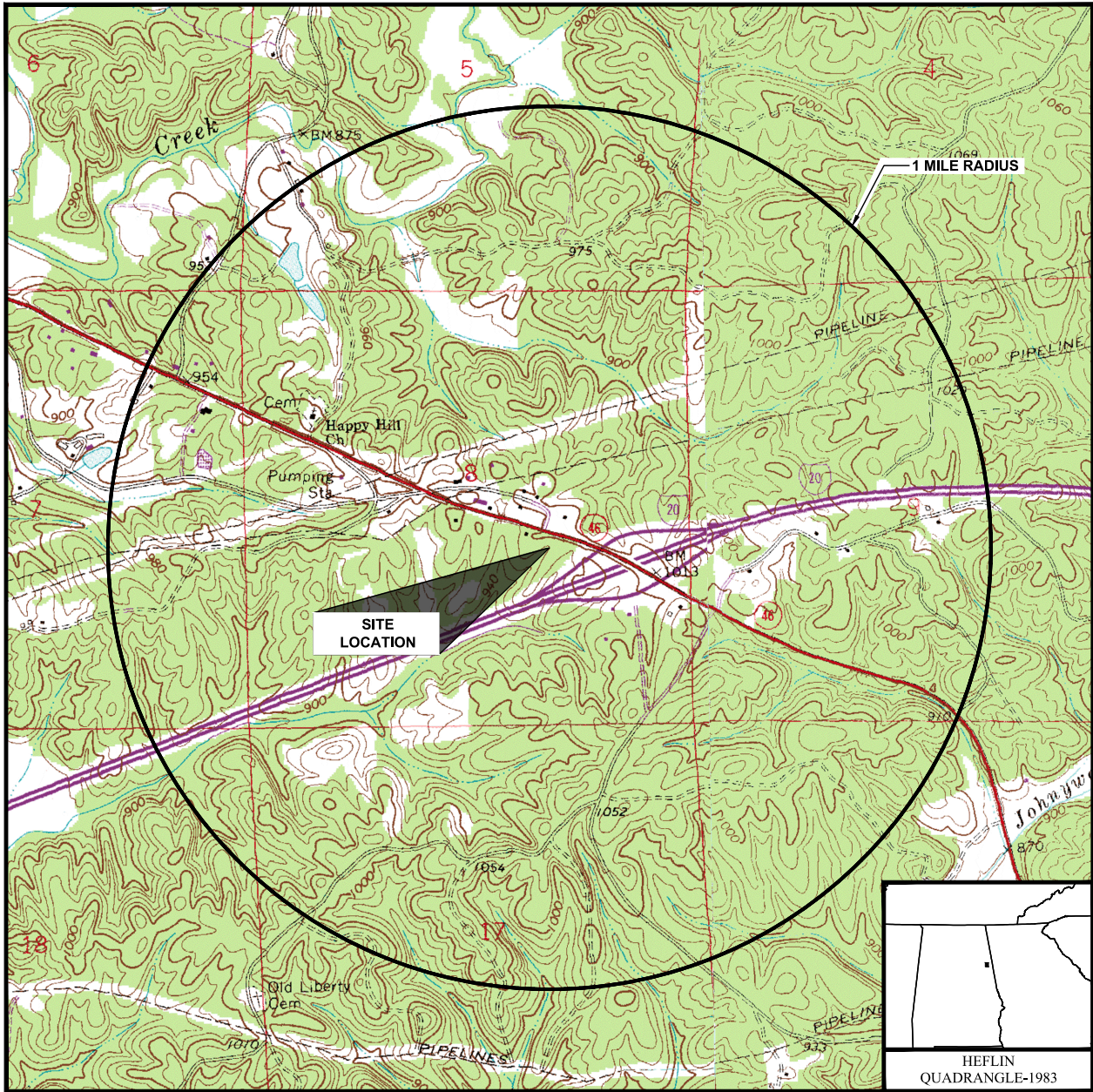
PPM anticipates the UIC permit can be obtained within 90 days of approval of this plan. Upon receipt of the UIC permit, PPM will contract Regensis to perform the injections. Regensis will likely need 60 days to procure the PetroFix<sup>®</sup> and to schedule the driller. PPM will notify ADEM five days in advance of the PetroFix<sup>®</sup> injections in efforts to allow department personnel the opportunity to visit the site during work activities if possible. If rescheduling is necessary, PPM will notify ADEM by telephone of the new date and reason for rescheduling.

Regensis anticipates that the injection activities can be completed in 8 work days, depending on site and weather conditions encountered. A baseline groundwater monitoring event will be completed prior to injection activities. The subsequent sampling event will be performed approximately 60 days after the injections are completed.

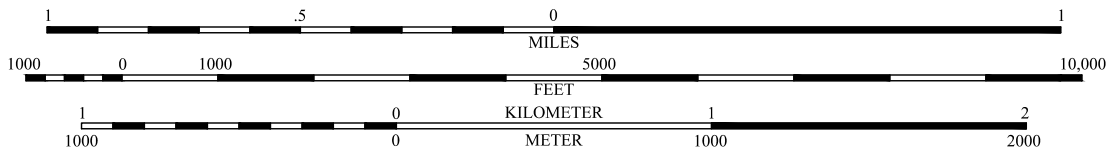
## 7.0 COST ESTIMATE


The work elements for this MCAP are eligible for reimbursement from the Alabama Tank Trust Fund (ATTF). Cost Proposal No. 27 for completion of the activities associated with implementation of the MCAP were submitted through the Alabama Environmental Permitting and Compliance System (AEPACS). Quarterly groundwater monitoring will be performed under separate cost proposals. Copies of quotes received for equipment rentals are included as **Appendix E, Equipment Quotes**.

## FIGURES



SCALE: 1 : 24,000



 <b>PPM CONSULTANTS, INC.</b> www.ppmco.com	
DRAWN BY: <b>BWH</b>	DRAWN DATE: <b>02/23/24</b>
PROJECT NUMBER: <b>455401</b>	PHASE: <b>MCAP</b>

**HIGHWAY 46  
 FUEL CENTER, INC.**  
 6658 HIGHWAY 46  
 HEFLIN, ALABAMA

**SITE LOCATION MAP**


FIGURE NUMBER

**1**





SOURCE: GOOGLE EARTH

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DRAWN BY: BWH	DRAWN DATE: 02/23/24
PROJECT NUMBER: 455401	PHASE: MCAP

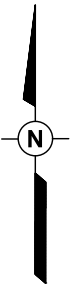
**HIGHWAY 46 FUEL CENTER, INC.**  
 6658 HIGHWAY 46  
 HEFLIN, ALABAMA

AREA MAP

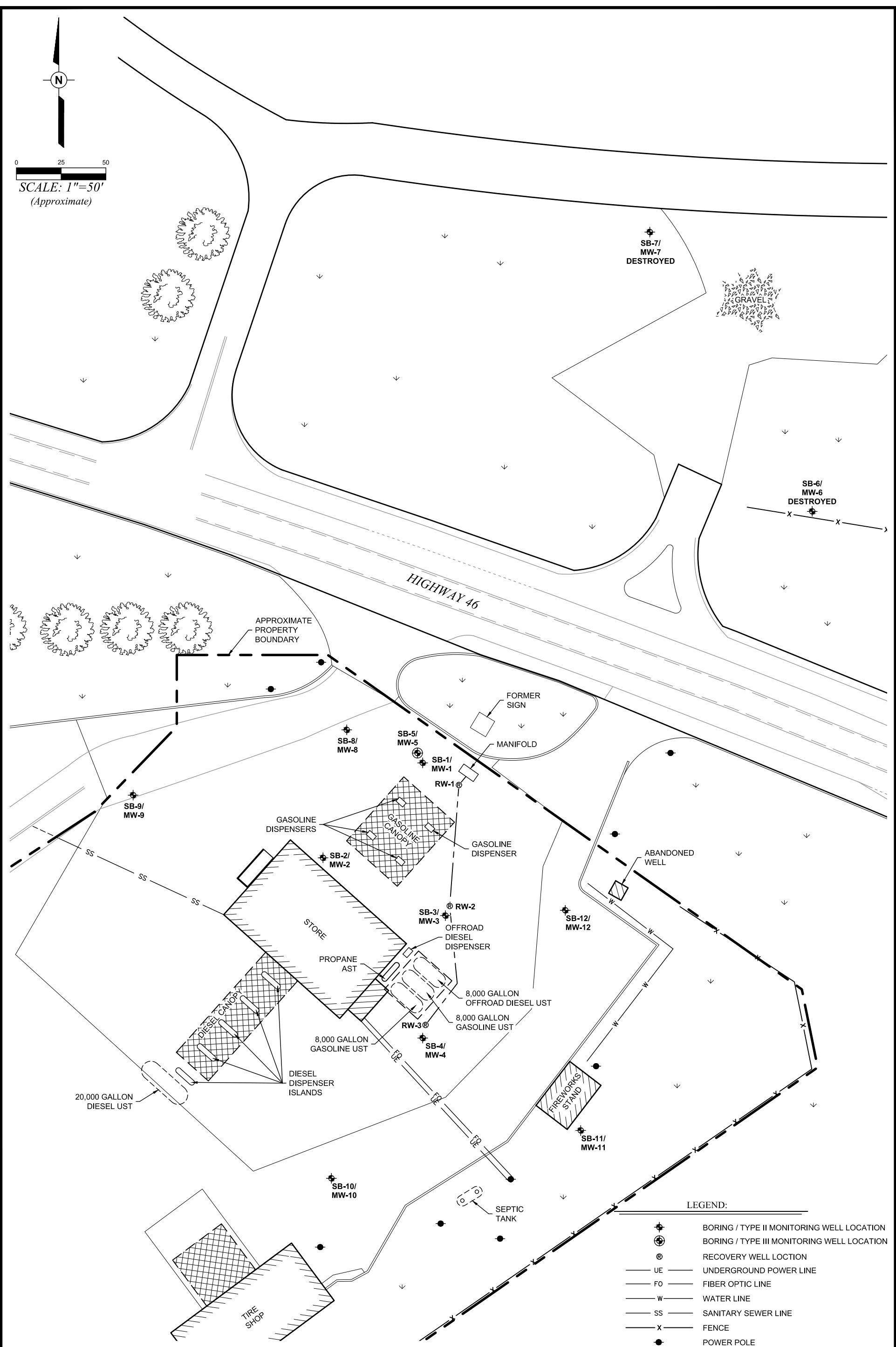
FIGURE NUMBER

2





0 25 50  
 SCALE: 1"=50'  
 (Approximate)



LEGEND:

- BORING / TYPE II MONITORING WELL LOCATION
- BORING / TYPE III MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- UNDERGROUND POWER LINE
- FIBER OPTIC LINE
- WATER LINE
- SANITARY SEWER LINE
- FENCE
- POWER POLE

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PROJECT NUMBER: 455401	PHASE: MCAP


HIGHWAY 46 FUEL CENTER, INC.  
 6658 HIGHWAY 46  
 HEFLIN, ALABAMA

SITE MAP

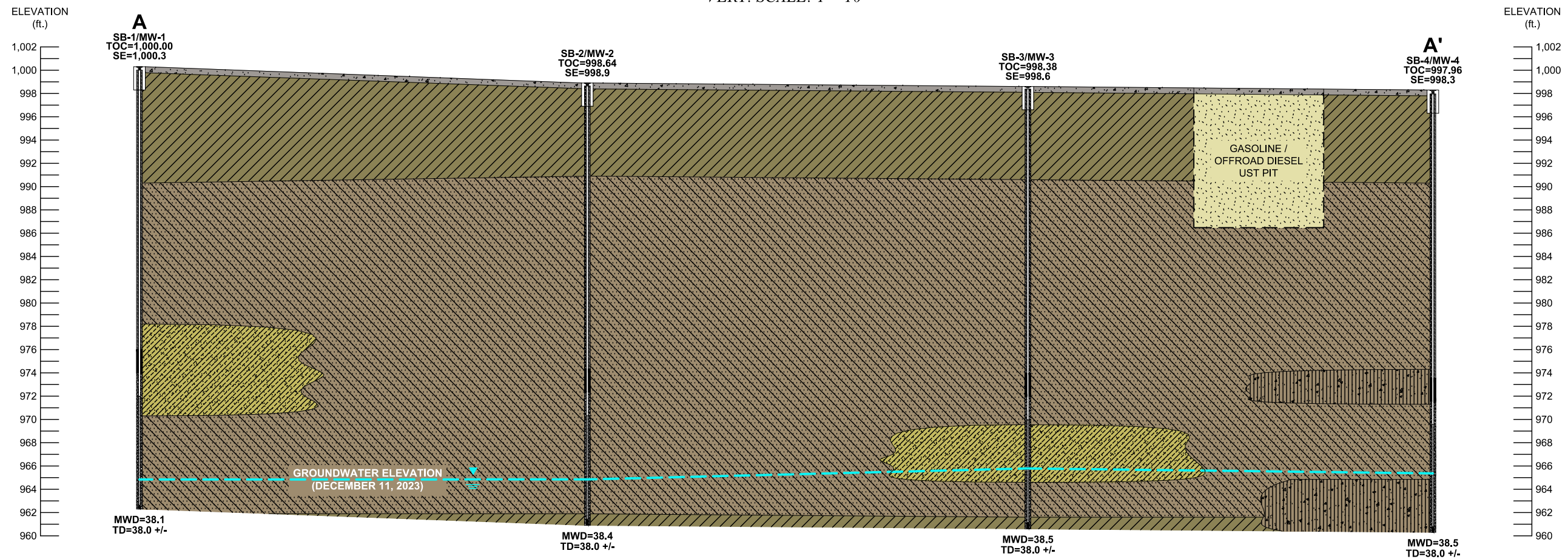
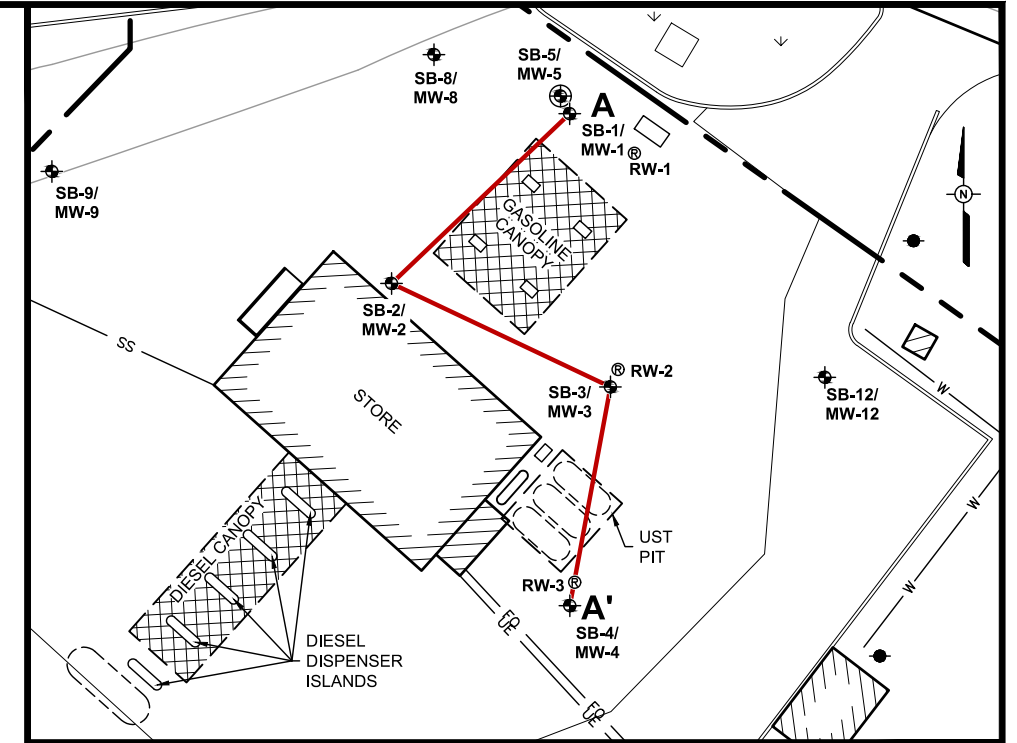
FIGURE NUMBER  
**3**

LEGEND:

-  CLAY
-  SILTY CLAY / SANDY CLAY
-  CLAYEY SAND
-  GRAVELLY CLAY
-  TANK PIT BACKFILL
-  CONCRETE

- TOC=1,000.00 TOP OF CASING (ft.)
- SE=1,000.3 SURFACE ELEVATION (ft.)
- TD=38.0 +/- TOTAL DEPTH OF BORING (ft.)
- MWD=38.1 MEASURED WELL DEPTH (ft.)
-  SCREENED INTERVAL W/SUMP

HORIZ. SCALE: 1"=20'  
VERT. SCALE: 1"=10'

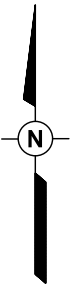


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PROJECT NUMBER: 455401	PHASE: MCAP

HIGHWAY 46 FUEL CENTER, INC.  
6658 HIGHWAY 46  
HEFLIN, ALABAMA

GEOLOGIC CROSS-SECTION  
A-A'

FIGURE NUMBER  
**4**



0 25 50  
 SCALE: 1"=50'  
 (Approximate)

SB-7/MW-7	11/30/18	
	4'-6"	39'-41"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.025	<0.025

SB-6/MW-6	11/30/18	
	4'-6"	39'-41"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.025	<0.025

SB-8/MW-8	11/26/18	
	9'-11"	29'-31"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.025	<0.025

SB-9/MW-9	11/26/18	
	4'-6"	29'-31"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.025	<0.025

SB-1/MW-1	01/22/18	
	22'-24"	34'-36"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.025	<0.025

SB-3/MW-3	01/22/18	
	19'-21"	29'-31"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	0.282
NAPHTHALENE (mg/kg)	<0.025	<0.025

SB-2/MW-2	01/23/18	
	14'-16"	29'-31"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.025	<0.025

SB-12/MW-12	11/27/18	
	4'-6"	24'-26"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.025	<0.025

SB-4/MW-4	01/23/18	
	4'-6"	29'-31"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	0.006	<0.005
NAPHTHALENE (mg/kg)	<0.025	<0.025

SB-10/MW-10	11/27/18	
	4'-6"	24'-26"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.025	<0.025

SB-11/MW-11	11/28/18	
	4'-6"	19'-21"
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.015	<0.015
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.025	<0.025

LEGEND:

- BORING / TYPE II MONITORING WELL LOCATION
- BORING / TYPE III MONITORING WELL LOCATION
- BELOW DETECTION LIMIT

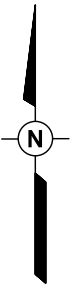
<b>PPM</b> PPM CONSULTANTS, INC. www.ppmco.com	
DRAWN BY: BWH	DRAWN DATE: 02/23/24
PROJECT NUMBER: 455401	PHASE: MCAP

HIGHWAY 46 FUEL CENTER, INC.  
 6658 HIGHWAY 46  
 HEFLIN, ALABAMA

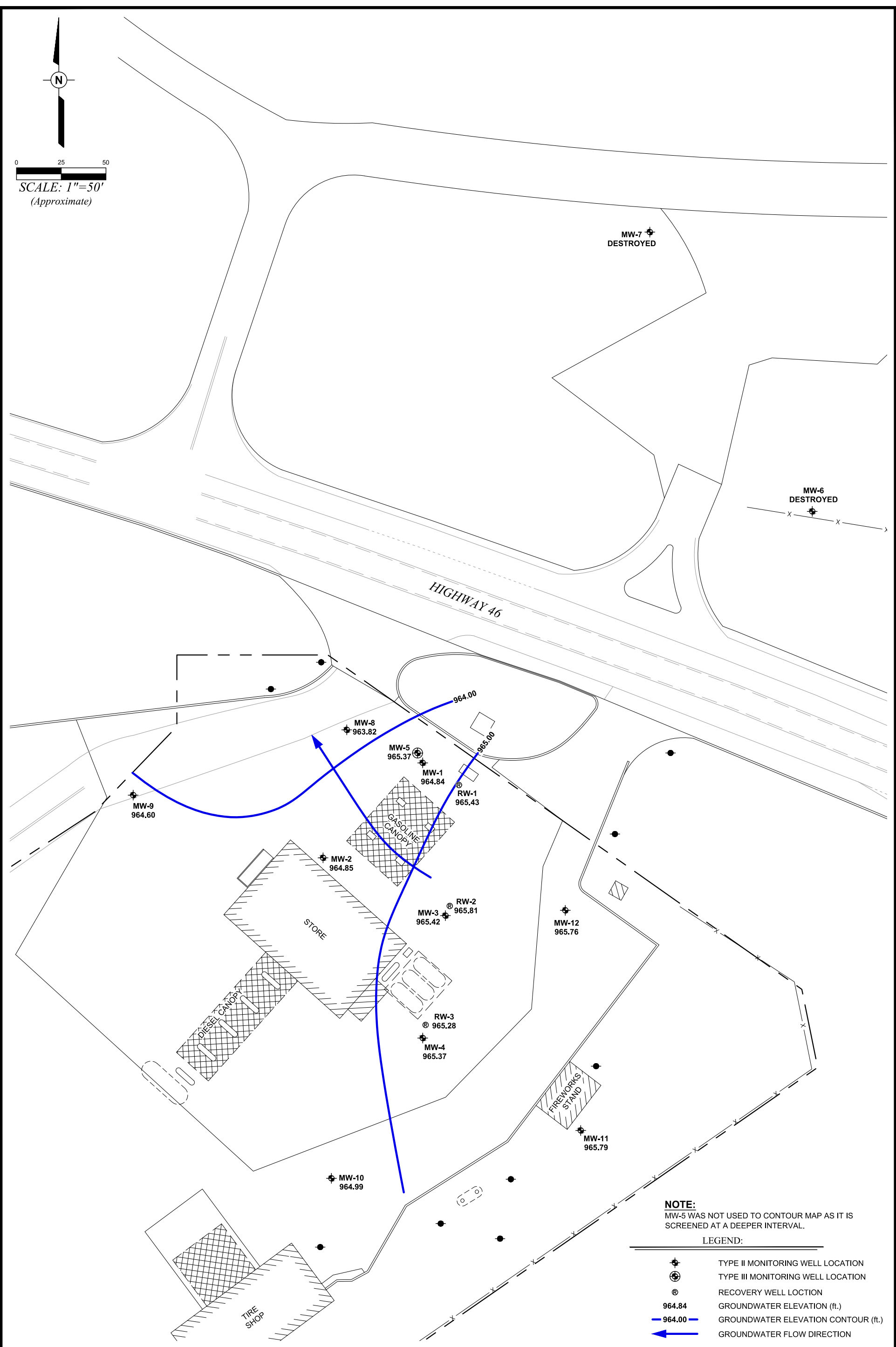
COC CONCENTRATIONS IN SOIL

FIGURE  
 NUMBER  
**5**





0 25 50  
 SCALE: 1"=50'  
 (Approximate)



MW-7  
 DESTROYED

MW-6  
 DESTROYED

HIGHWAY 46

MW-8  
 963.82

MW-5  
 965.37

MW-1  
 964.84

RW-1  
 965.43

MW-9  
 964.60

MW-2  
 964.85

MW-3  
 965.42

RW-2  
 965.81

MW-12  
 965.76

STORE

RW-3  
 965.28

MW-4  
 965.37

FIREWORKS  
 STAND





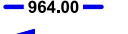

MW-11  
 965.79

MW-10  
 964.99

TIRE  
 SHOP

**NOTE:**  
 MW-5 WAS NOT USED TO CONTOUR MAP AS IT IS  
 SCREENED AT A DEEPER INTERVAL.

LEGEND:

-  TYPE II MONITORING WELL LOCATION
-  TYPE III MONITORING WELL LOCATION
-  RECOVERY WELL LOCATION
-  964.84 GROUNDWATER ELEVATION (ft.)
-  964.00 GROUNDWATER ELEVATION CONTOUR (ft.)
-  GROUNDWATER FLOW DIRECTION

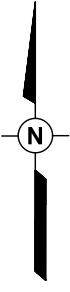
<b>PPM</b> PPM CONSULTANTS, INC. www.ppmco.com	
DRAWN BY: BWH	DRAWN DATE: 02/23/24
PROJECT NUMBER: 455401	PHASE: MCAP

HIGHWAY 46 FUEL CENTER, INC.  
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 HEFLIN, ALABAMA

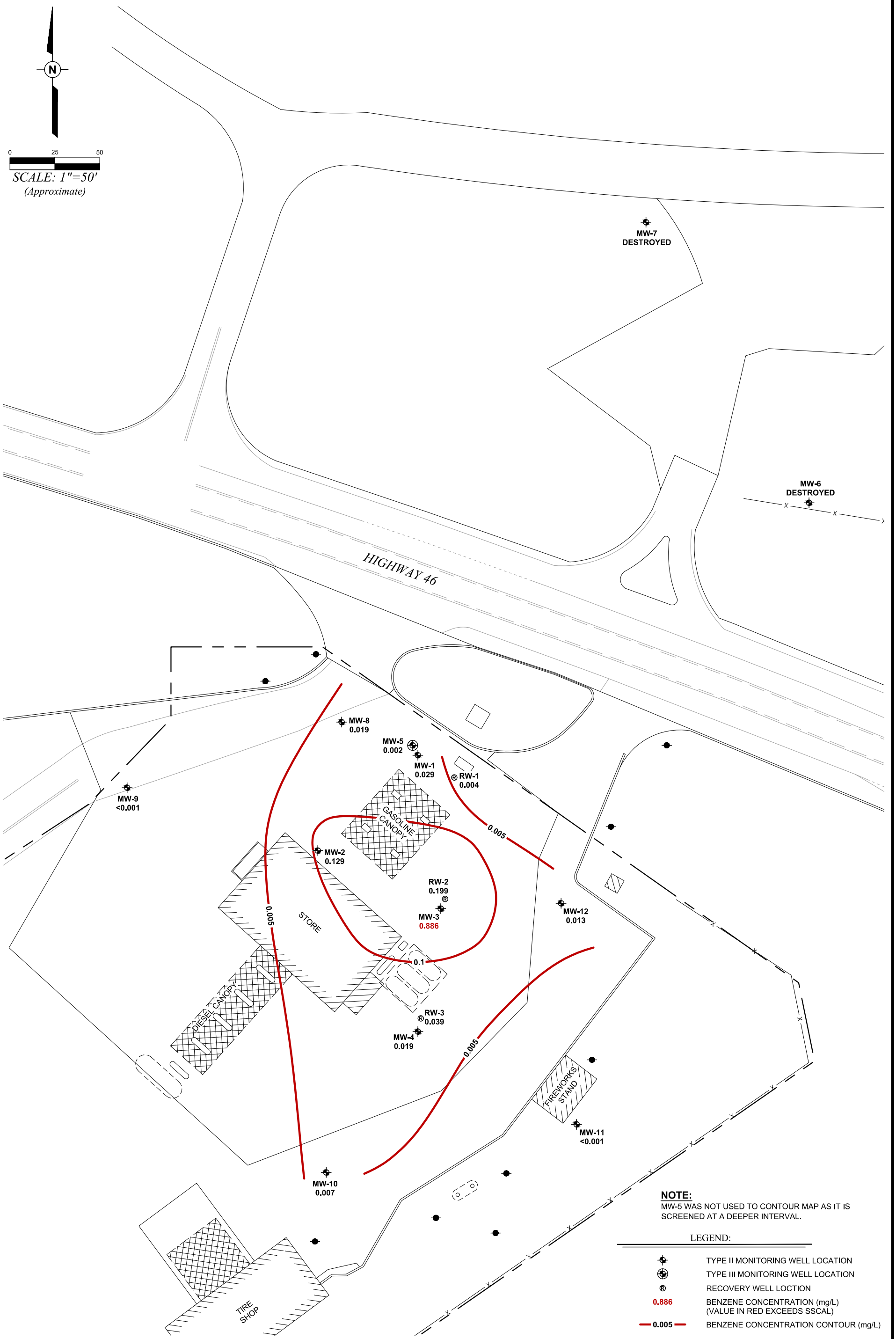
GROUNDWATER ELEVATION MAP  
 (DECEMBER 11, 2023)

FIGURE  
 NUMBER  
**6**








0 25 50  
 SCALE: 1"=50'  
 (Approximate)



**NOTE:**  
 MW-5 WAS NOT USED TO CONTOUR MAP AS IT IS SCREENED AT A DEEPER INTERVAL.

**LEGEND:**

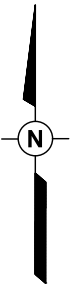
-  TYPE II MONITORING WELL LOCATION
-  TYPE III MONITORING WELL LOCATION
-  RECOVERY WELL LOCATION
- 0.886** BENZENE CONCENTRATION (mg/L)  
(VALUE IN RED EXCEEDS SSCAL)
- 0.005** BENZENE CONCENTRATION CONTOUR (mg/L)

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PROJECT NUMBER: 455401	PHASE: MCAP

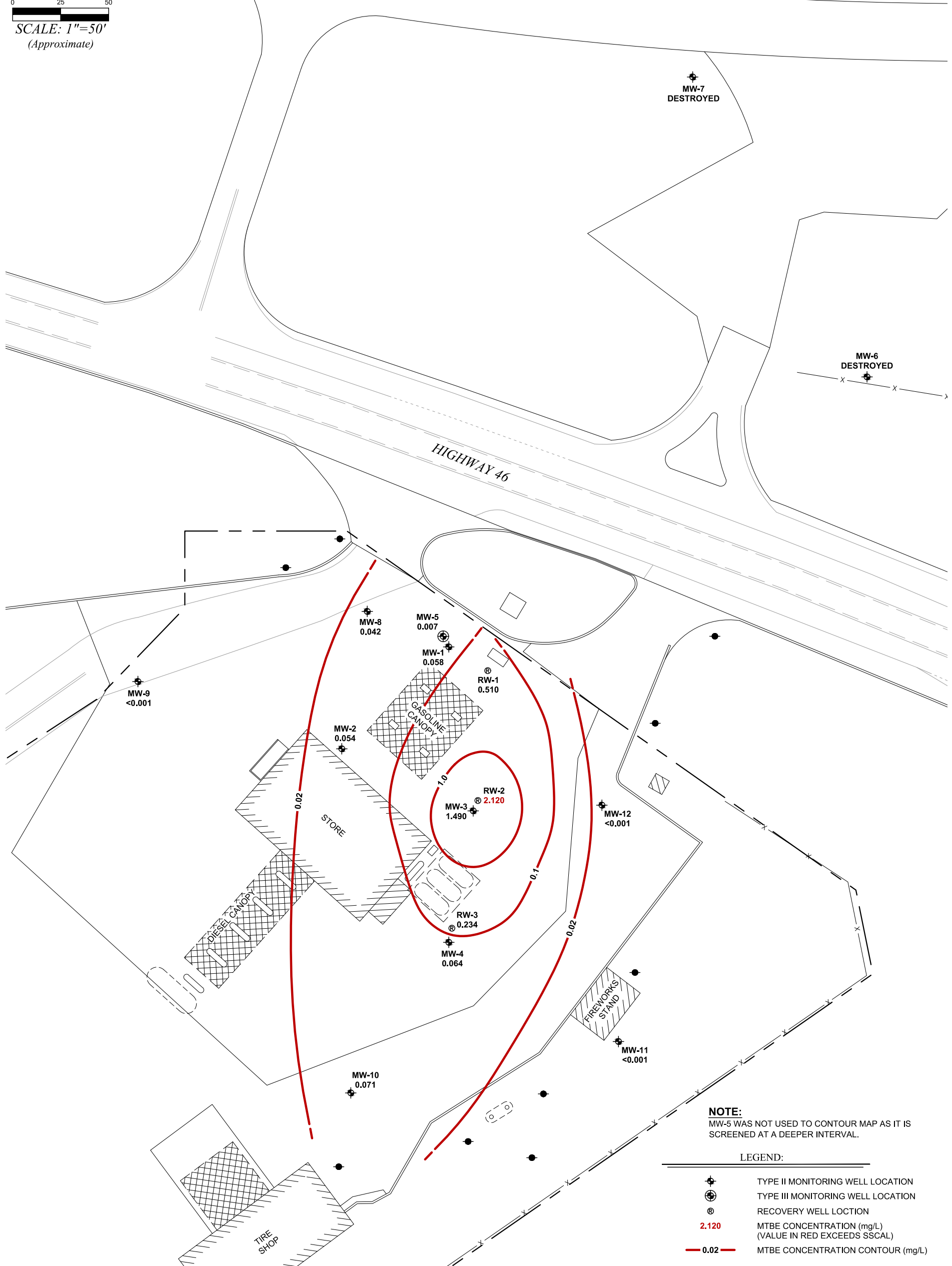
HIGHWAY 46 FUEL CENTER, INC.  
 6658 HIGHWAY 46  
 HEFLIN, ALABAMA

DISSOLVED BENZENE  
 ISOCONCENTRATION MAP  
 (DECEMBER 11, 2023)

FIGURE  
 NUMBER  
**7**



0 25 50  
 SCALE: 1"=50'  
 (Approximate)



**NOTE:**  
 MW-5 WAS NOT USED TO CONTOUR MAP AS IT IS SCREENED AT A DEEPER INTERVAL.

**LEGEND:**

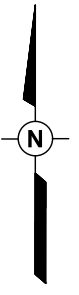
- TYPE II MONITORING WELL LOCATION
- TYPE III MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- 2.120** MTBE CONCENTRATION (mg/L)  
(VALUE IN RED EXCEEDS SSCAL)
- 0.02 MTBE CONCENTRATION CONTOUR (mg/L)

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PROJECT NUMBER: 455401	PHASE: MCAP

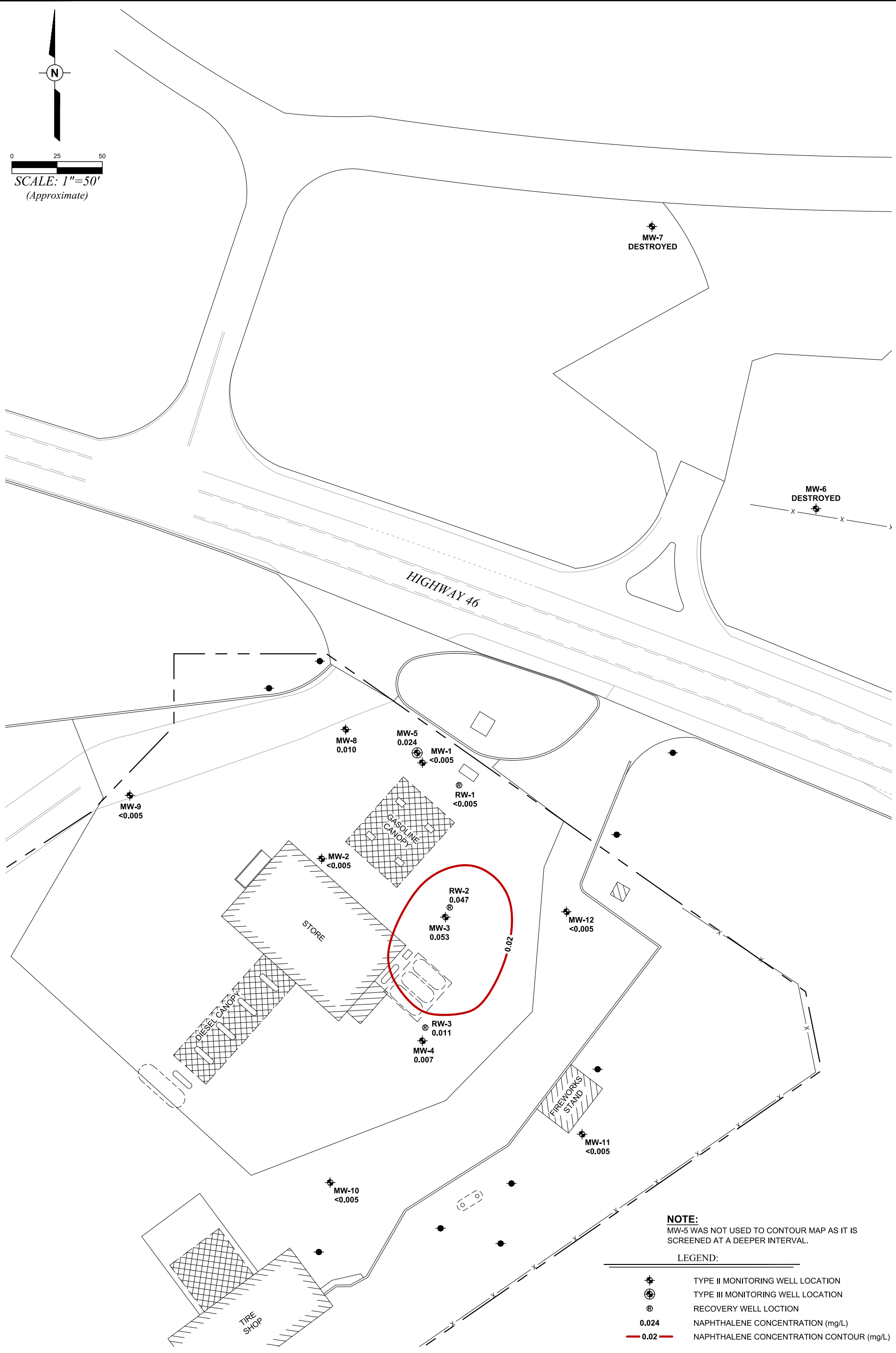
HIGHWAY 46 FUEL CENTER, INC.  
 6658 HIGHWAY 46  
 HEFLIN, ALABAMA

DISSOLVED MTBE  
 ISOCONCENTRATION MAP  
 (DECEMBER 11, 2023)

FIGURE  
 NUMBER  
**8**



0 25 50  
 SCALE: 1"=50'  
 (Approximate)



**NOTE:**  
 MW-5 WAS NOT USED TO CONTOUR MAP AS IT IS SCREENED AT A DEEPER INTERVAL.

**LEGEND:**

- TYPE II MONITORING WELL LOCATION
- TYPE III MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- 0.024 NAPHTHALENE CONCENTRATION (mg/L)
- NAPHTHALENE CONCENTRATION CONTOUR (mg/L)

<b>PPM</b> PPM CONSULTANTS, INC. www.ppmco.com	
DRAWN BY: BWH	DRAWN DATE: 02/23/24
PROJECT NUMBER: 455401	PHASE: MCAP

HIGHWAY 46 FUEL CENTER, INC.  
 6658 HIGHWAY 46  
 HEFLIN, ALABAMA

DISSOLVED NAPHTHALENE  
 ISOCONCENTRATION MAP  
 (DECEMBER 11, 2023)

FIGURE  
 NUMBER  
**9**

## TABLES

**TABLE 1  
SOIL ANALYTICAL SUMMARY  
HIGHWAY 46 FUEL CENTER  
HEFLIN, ALABAMA**

SAMPLE I.D.	SAMPLE DEPTH (ft BGS)	SAMPLE DATE	HEADSPACE READING (ppmv)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	MTBE (mg/kg)	NAPH-THALENE (mg/kg)
SB-1-22-24	22-24	01/22/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-1-34-36	34-36	01/22/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-2-14-16	14-16	01/23/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-2-29-31	29-31	01/23/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-3-19-21	19-21	01/22/18	35	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-3-29-31	29-31	01/22/18	120	<0.005	<0.005	<0.005	<0.015	BDL	0.282	<0.025
SB-4-4-6	4-6	01/23/18	40	<0.005	<0.005	<0.005	<0.015	BDL	0.006	<0.025
SB-4-29-31	29-31	01/23/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-6-4-6	4-6	11/30/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-6-39-41	39-41	11/30/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-7-4-6	4-6	11/30/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-7-39-41	39-41	11/30/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-8-9-11	9-11	11/26/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-8-29-31	29-31	11/26/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-9-4-6	4-6	11/26/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-9-29-31	29-31	11/26/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-10-4-6	4-6	11/27/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-10-24-26	24-26	11/27/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-11-4-6	4-6	11/28/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-11-19-21	19-21	11/28/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-12-4-6	4-6	11/27/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
SB-12-24-26	24-26	11/27/18	0	<0.005	<0.005	<0.005	<0.015	BDL	<0.005	<0.025
<b>SSCALs - Indoor Inhalation - Commercial Worker</b>				<b>1.523</b>	<b>276.3</b>	<b>548.6</b>	<b>403.1</b>	<b>--</b>	<b>3,577</b>	<b>348.7</b>
<b>SSCALs - GRP Source Soil</b>				<b>18.12</b>	<b>276.3</b>	<b>548.6</b>	<b>403.1</b>	<b>--</b>	<b>23.88</b>	<b>348.7</b>

Notes: ft BGS - feet below ground surface (approximate)  
 ppmv - parts per million by volume  
 mg/kg - milligrams per kilogram  
 BDL - below detection limit  
 Headspace analysis conducted with a RKI (calibrated to hexane)  
 BTEX/MTBE/Naphthalene analyses conducted per EPA Method 8260  
 SSCAL - Site-specific Corrective Action Level (Proposed)  
 GRP - Groundwater Resource Protection (lower of GRP Source and Indoor Inhalation - Commercial Worker)  
 Shaded soil samples are compared to GRP Source Soil SSCALs

Source: PPM Consultants, Inc.  
 PPM Project No. 455401-MCAP

**TABLE 2**  
**GROUNDWATER ELEVATION SURVEY DATA**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

WELL I.D.	DATE	SURFACE ELEVATION (ft)	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft)	DEPTH TO WATER (ft-BTOC)	GROUND-WATER ELEVATION (ft)
MW-1	01/29/18	1,000.3	1,000.00	38.1	972.0 - 962.6	32.74	967.26
	12/10/18			38.1		32.92	967.08
	06/06/19			38.1		30.88	969.12
	09/06/19			38.0		32.91	967.09
	12/16/19			38.0		33.73	966.27
	03/12/20			38.0		29.67	970.33
	08/05/20			37.9		30.35	969.65
	11/04/20			38.3		32.05	967.95
	02/12/21			38.0		32.25	967.75
	05/05/21			38.0		31.51	968.49
	08/03/21			38.0		30.01	969.99
	11/15/21			38.1		31.93	968.07
	02/03/22			38.1		31.86	968.14
	05/02/22			38.0		30.89	969.11
	09/19/22			38.1		33.28	966.72
	12/13/22			38.0		34.32	965.68
	03/15/23			37.8		32.12	967.88
	06/23/23			38.0		31.77	968.23
09/11/23	37.9	33.52	966.48				
12/11/23	38.2	35.16	964.84				
MW-2	01/29/18	998.9	998.64	38.4	970.3 - 960.8	31.25	967.39
	12/10/18			38.2		31.41	967.23
	06/06/19			38.2		29.41	969.23
	09/06/19			38.3		31.43	967.21
	12/16/19			38.3		32.22	966.42
	03/12/20			38.3		28.20	970.44
	08/05/20			38.2		28.89	969.75
	11/04/20			38.3		30.60	968.04
	02/12/21			38.3		30.78	967.86
	05/05/21			38.2		30.05	968.59
	08/03/21			38.3		28.80	969.84
	11/15/21			38.3		30.47	968.17
	02/03/22			38.3		30.36	968.28
	05/02/22			38.2		29.42	969.22
	09/19/22			38.4		31.81	966.83
	12/13/22			38.2		32.84	965.80
	03/15/23			38.1		30.60	968.04
	06/23/23			38.3		30.31	968.33
09/11/23	38.3	31.99	966.65				
12/11/23	38.5	33.79	964.85				

**TABLE 2**  
**GROUNDWATER ELEVATION SURVEY DATA**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

WELL I.D.	DATE	SURFACE ELEVATION (ft)	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft)	DEPTH TO WATER (ft-BTOC)	GROUND-WATER ELEVATION (ft)
MW-3	01/29/18	998.6	998.38	38.5	969.9 - 960.5	29.71	968.67
	12/10/18			38.5		29.24	969.14
	06/06/19			38.6		28.36	970.02
	09/06/19			38.5		30.49	967.89
	12/16/19			38.5		30.52	967.86
	03/12/20			38.4		25.72	972.66
	08/05/20			38.4		28.00	970.38
	11/04/20			38.8		29.25	969.13
	02/12/21			38.3		28.83	969.55
	05/05/21			38.5		28.28	970.10
	08/03/21			38.4		27.07	971.31
	11/15/21			38.4		29.26	969.12
	02/03/22			38.4		28.21	970.17
	05/02/22			38.3		27.83	970.55
	09/19/22			38.5		30.71	967.67
	12/13/22			38.2		31.55	966.83
	03/15/23			38.1		28.58	969.80
	06/23/23			38.4		29.29	969.09
09/11/23	38.4	31.25	967.13				
12/11/23	38.6	32.96	965.42				
MW-4	01/29/18	998.3	997.96	38.5	969.6 - 960.1	28.92	969.04
	12/10/18			38.5		28.01	969.95
	06/06/19			38.5		28.12	969.84
	09/06/19			38.4		30.22	967.74
	12/16/19			38.4		29.66	968.30
	03/12/20			38.6		24.55	973.41
	08/05/20			38.3		27.85	970.11
	11/04/20			38.4		28.80	969.16
	02/12/21			38.5		28.14	969.82
	05/05/21			38.4		27.80	970.16
	08/03/21			38.3		26.46	971.50
	11/15/21			38.5		28.91	969.05
	02/03/22			38.4		27.34	970.62
	05/02/22			38.3		27.06	970.90
	09/19/22			38.3		30.33	967.63
	12/13/22			38.2		30.59	967.37
	03/15/23			38.2		27.20	970.76
	06/23/23			38.3		28.84	969.12
09/11/23	38.4	30.96	967.00				
12/11/23	38.4	32.59	965.37				

**TABLE 2  
GROUNDWATER ELEVATION SURVEY DATA  
HIGHWAY 46 FUEL CENTER  
HEFLIN, ALABAMA**

WELL I.D.	DATE	SURFACE ELEVATION (ft)	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft)	DEPTH TO WATER (ft-BTOC)	GROUND-WATER ELEVATION (ft)
MW-5	12/10/18	1,000.5	1,000.27	75.6	929.7 - 925.4	35.69	964.58
	06/06/19			75.5		31.56	968.71
	09/06/19			75.1		32.79	967.48
	12/16/19			74.6		42.52	957.75
	03/12/20			74.7		30.22	970.05
	08/05/20			74.5		48.75	951.52
	11/04/20			75.4		31.97	968.30
	02/12/21			75.4		33.10	967.17
	05/05/21			75.0		32.15	968.12
	08/03/21			74.5		30.71	969.56
	11/15/21			74.6		32.83	967.44
	02/03/22			75.4		32.83	967.44
	05/02/22			74.8		31.41	968.86
	09/19/22			74.7		33.80	966.47
	12/13/22			74.8		34.41	965.86
	03/15/23			74.6		32.77	967.50
	06/23/23			74.6		31.95	968.32
09/11/23	74.6	33.57	966.70				
12/11/23	75.4	34.90	965.37				
MW-6	12/10/18	1,005.5	1,004.99	50.6	964.4 - 955.1	42.83	962.16
	06/06/19			50.4		38.85	966.14
	09/06/19			50.4		41.07	963.92
	12/16/19			50.4		42.24	962.75
	03/12/20			50.4		37.39	967.60
	08/05/20			50.4		38.41	966.58
	11/04/20			50.8		40.30	964.69
	02/12/21			50.6		40.38	964.61
	05/05/21			50.4		39.14	965.85
	Monitoring well destroyed by cnstruction activities.						
MW-7	12/10/18	1,007.9	1,007.64	50.3	967.3 - 958.0	44.80	962.84
	06/06/19			NL		NL	NL
	09/06/19			50.4		46.53	961.11
	12/16/19			NL		NL	NL
	03/12/20			50.8		39.25	968.39
	08/05/20			50.3		41.66	965.98
	11/04/20			50.5		43.52	964.12
	02/12/21			50.4		43.52	964.12
	05/05/21			50.2		42.29	965.35
Monitoring well destroyed by cnstruction activities.							



**TABLE 2  
GROUNDWATER ELEVATION SURVEY DATA  
HIGHWAY 46 FUEL CENTER  
HEFLIN, ALABAMA**

WELL I.D.	DATE	SURFACE ELEVATION (ft)	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft)	DEPTH TO WATER (ft-BTOC)	GROUND-WATER ELEVATION (ft)
MW-8	12/10/18	999.8	998.48	NM	964.3 - 955.0	NM	NM
	06/06/19			44.7		30.39	968.09
	09/06/19			44.7		32.45	966.03
	12/16/19			44.7		33.46	965.02
	03/12/20			44.6		29.36	969.12
	08/05/20			44.6		29.80	968.68
	11/04/20			45.0		31.65	966.83
	02/12/21			NM		NM	NM
	05/05/21			44.6		29.97	968.51
	08/03/21			44.5		30.11	968.37
	11/15/21			44.7		31.50	966.98
	02/03/22			44.6		31.97	966.51
	05/02/22			44.6		30.46	968.02
	09/19/22			44.7		32.77	965.71
	12/13/22			44.4		33.57	964.91
	03/15/23			43.5		31.75	966.73
	06/23/23			44.5		31.23	967.25
09/11/23	44.5	32.90	965.58				
12/11/23	44.5	34.66	963.82				
MW-9	12/10/18	998.1	997.60	40.8	966.8 - 957.5	31.60	966.00
	06/06/19			41.0		28.57	969.03
	09/06/19			40.7		30.75	966.85
	12/16/19			40.8		31.82	965.78
	03/12/20			41.1		27.12	970.48
	08/05/20			40.7		28.00	969.60
	11/04/20			40.7		30.00	967.60
	02/12/21			40.9		30.25	967.35
	05/05/21			40.8		29.38	968.22
	08/03/21			40.7		28.77	968.83
	11/15/21			39.7		29.86	967.74
	02/03/22			40.8		29.98	967.62
	05/02/22			40.6		28.69	968.91
	09/19/22			40.9		31.04	966.56
	12/13/22			40.6		32.11	965.49
	03/15/23			40.5		29.93	967.67
	06/23/23			40.6		29.29	968.31
09/11/23	40.5	32.00	965.60				
12/11/23	40.6	33.00	964.60				

**TABLE 2**  
**GROUNDWATER ELEVATION SURVEY DATA**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

WELL I.D.	DATE	SURFACE ELEVATION (ft)	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft)	DEPTH TO WATER (ft-BTOC)	GROUND-WATER ELEVATION (ft)
MW-10	12/10/18	996.3	995.97	40.1	965.9 - 956.6	26.20	969.77
	06/06/19			40.1		26.48	969.49
	09/06/19			40.0		28.50	967.47
	12/16/19			39.9		27.87	968.10
	03/12/20			39.9		23.00	972.97
	08/05/20			39.8		26.12	969.85
	11/04/20			39.8		27.05	968.92
	02/12/21			39.9		26.48	969.49
	05/05/21			39.8		26.20	969.77
	08/03/21			39.7		23.40	972.57
	11/15/21			39.7		27.23	968.74
	02/03/22			39.7		26.53	969.44
	05/02/22			39.6		25.82	970.15
	09/19/22			39.7		28.62	967.35
	12/13/22			39.7		29.00	966.97
	03/15/23			39.6		25.59	970.38
	06/23/23			39.6		27.13	968.84
09/11/23	39.5	29.08	966.89				
12/11/23	39.8	30.98	964.99				
MW-11	12/10/18	996.8	996.51	40.1	966.4 - 957.1	24.40	972.11
	06/06/19			40.1		25.95	970.56
	09/06/19			40.1		28.20	968.31
	12/16/19			40.1		27.17	969.34
	03/12/20			40.4		21.22	975.29
	08/05/20			40.0		25.80	970.71
	11/04/20			40.1		26.50	970.01
	02/12/21			40.1		25.11	971.40
	05/05/21			40.0		24.61	971.90
	08/03/21			40.1		24.01	972.50
	11/15/21			40.1		26.67	969.84
	02/03/22			40.1		26.55	969.96
	05/02/22			40.0		25.00	971.51
	09/19/22			40.0		28.16	968.35
	12/13/22			40.0		28.46	968.05
	03/15/23			40.1		24.09	972.42
	06/23/23			40.1		26.62	969.89
09/11/23	40.0	28.96	967.55				
12/11/23	40.1	30.72	965.79				

**TABLE 2**  
**GROUNDWATER ELEVATION SURVEY DATA**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

WELL I.D.	DATE	SURFACE ELEVATION (ft)	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft)	DEPTH TO WATER (ft-BTOC)	GROUND-WATER ELEVATION (ft)
MW-12	12/10/18	999.5	999.07	40.6	968.5 - 959.1	28.30	970.77
	06/06/19			40.6		28.39	970.68
	09/06/19			40.5		30.64	968.43
	12/16/19			40.5		30.22	968.85
	03/12/20			40.5		24.43	974.64
	08/05/20			40.3		28.20	970.87
	11/04/20			40.7		29.20	969.87
	02/12/21			40.5		28.47	970.60
	05/05/21			40.5		28.00	971.07
	08/03/21			40.3		26.51	972.56
	11/15/21			40.4		29.25	969.82
	02/03/22			44.3		28.31	970.76
	05/02/22			40.3		27.54	971.53
	09/19/22			40.4		29.93	969.14
	12/13/22			40.1		31.14	967.93
	03/15/23			40.2		27.79	971.28
06/23/23	40.3	29.30	969.77				
09/11/23	40.3	31.51	967.56				
12/11/23	40.3	33.31	965.76				
RW-1	08/05/20	1,000.5	1,000.16	40.2	974.7 - 960.2	30.28	969.88
	11/04/20			40.5		32.00	968.16
	02/12/21			40.8		32.05	968.11
	05/05/21			40.4		31.28	968.88
	08/03/21			40.8		30.04	970.12
	11/15/21			40.4		31.85	968.31
	02/03/22			40.2		31.85	968.31
	05/02/22			39.9		30.14	970.02
	09/19/22			40.3		32.74	967.42
	12/13/22			39.7		33.69	966.47
	03/15/23			40.5		31.31	968.85
	06/23/23			39.9		31.26	968.90
	09/11/23			40.5		32.99	967.17
12/11/23	40.7	34.73	965.43				
RW-2	08/05/20	998.7	998.32	40.6	971.5 - 957.0	27.95	970.37
	11/04/20			41.1		29.20	969.12
	02/12/21			41.3		28.73	969.59
	05/05/21			40.8		28.20	970.12
	08/03/21			40.8		26.90	971.42
	11/15/21			40.7		29.19	969.13
	02/03/22			40.8		25.17	973.15
	05/02/22			40.4		27.35	970.97
	09/19/22			41.1		30.21	968.11
	12/13/22			40.2		31.08	967.24
	03/15/23			40.1		27.99	970.33
	06/23/23			40.4		28.78	969.54
	09/11/23			40.6		30.70	967.62
12/11/23	40.6	32.51	965.81				

**TABLE 2  
GROUNDWATER ELEVATION SURVEY DATA  
HIGHWAY 46 FUEL CENTER  
HEFLIN, ALABAMA**

<b>WELL I.D.</b>	<b>DATE</b>	<b>SURFACE ELEVATION (ft)</b>	<b>TOP OF CASING ELEVATION (ft)</b>	<b>WELL DEPTH (ft-BTOC)</b>	<b>SCREENED INTERVAL (ft)</b>	<b>DEPTH TO WATER (ft-BTOC)</b>	<b>GROUND-WATER ELEVATION (ft)</b>
RW-3	08/05/20	998.3	997.90	40.9	971.8 - 957.4	27.76	970.14
	11/04/20			40.9		28.70	969.20
	02/12/21			41.1		28.06	969.84
	05/05/21			41.0		27.74	970.16
	08/03/21			41.1		26.22	971.68
	11/15/21			40.9		28.84	969.06
	02/03/22			41.0		13.00	984.90
	05/02/22			41.0		27.26	970.64
	09/19/22			40.9		30.26	967.64
	12/13/22			40.9		30.80	967.10
	03/15/23			40.7		27.44	970.46
	06/23/23			41.0		28.77	969.13
	09/11/23			40.9		30.94	966.96
	12/11/23			41.2		32.62	965.28

Notes: *ft-BTOC - feet below top of casing*  
*Elevations based on approximate NGVD of 1,000 feet above mean sea level as referenced from the Heflin, Alabama USGS 7.5 Minute Quadrangle Topographic Map*  
*NM - Not Measured*  
*NL - Not Located*

Source: *PPM Consultants, Inc.*  
*PPM Project No.: 455401-MCAP*

**TABLE 3  
GROUNDWATER ANALYTICAL SUMMARY  
HIGHWAY 46 FUEL CENTER  
HEFLIN, ALABAMA**

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPHTHALENE (mg/L)
MW-1	01/29/18	0.208	<0.001	<0.001	0.041	0.249	0.122	<0.005
	12/10/18	0.176	<0.002	<0.002	0.041	0.217	0.154	0.011
	06/06/19	0.044	<0.001	<0.001	0.008	0.052	0.024	<0.005
	09/06/19	0.057	<0.001	<0.001	0.012	0.069	0.033	<0.005
	12/16/19	0.143	<0.001	<0.001	0.037	0.180	0.097	<0.005
	03/12/20	0.320	<0.001	<0.001	0.066	0.386	0.248	0.013
	08/05/20	0.032	<0.001	<0.001	0.011	0.043	0.021	<0.005
	11/04/20	0.080	<0.001	<0.001	0.025	0.105	0.070	<0.005
	02/12/21	0.145	<0.001	<0.001	0.040	0.185	0.158	0.006
	05/05/21	0.111	<0.001	<0.001	0.027	0.138	0.113	0.006
	08/03/21	0.124	<0.001	<0.001	0.037	0.161	0.168	0.013
	11/15/21	0.055	<0.001	<0.001	0.016	0.071	0.070	<0.005
	02/03/22	0.111	<0.001	<0.001	0.029	0.140	0.152	0.013
	05/02/22	0.102	<0.002	<0.002	0.030	0.132	0.170	0.007
	09/19/22	0.068	<0.001	<0.001	0.031	0.099	0.061	<0.005
	12/13/22	0.050	<0.001	<0.001	0.022	0.072	0.064	<0.005
	03/15/23	0.141	<0.001	<0.001	0.044	0.185	0.328	0.018
06/23/23	0.041	<0.001	<0.001	0.022	0.063	0.057	<0.005	
09/11/23	0.042	<0.001	<0.001	0.027	0.069	0.077	<0.005	
12/11/23	0.029	<0.001	<0.001	0.020	0.049	0.058	<0.005	
<b>GRP Values (Source)</b>		<b>0.4658</b>	<b>93.15</b>	<b>65.21</b>	<b>175</b>	<b>--</b>	<b>1.863</b>	<b>1.863</b>
MW-2	01/29/18	0.078	<0.001	<0.001	0.034	0.112	0.029	<0.005
	12/10/18	0.130	<0.001	<0.001	0.067	0.197	0.041	<0.005
	06/06/19	0.087	<0.001	<0.001	0.039	0.126	0.024	<0.005
	09/06/19	0.111	<0.001	<0.001	0.049	0.160	0.031	<0.005
	12/16/19	0.135	<0.001	<0.001	0.065	0.200	0.044	<0.005
	03/12/20	0.147	<0.001	<0.001	0.070	0.217	0.042	<0.005
	08/05/20	0.080	<0.001	<0.001	0.046	0.126	0.029	<0.005
	11/04/20	0.128	<0.001	<0.001	0.070	0.198	0.040	<0.005
	02/12/21	0.169	<0.001	<0.001	0.087	0.256	0.058	<0.005
	05/05/21	0.173	<0.001	<0.001	0.081	0.254	0.049	<0.005
	08/03/21	0.152	<0.001	<0.001	0.073	0.225	0.055	<0.005
	11/15/21	0.133	<0.001	<0.001	0.084	0.217	0.052	<0.005
	02/03/22	0.092	<0.001	<0.001	0.045	0.137	0.038	<0.005
	05/02/22	0.190	<0.001	<0.001	0.093	0.283	0.074	<0.005
	09/19/22	0.124	<0.001	<0.001	0.068	0.192	0.042	<0.005
	12/13/22	0.183	<0.001	<0.001	0.085	0.268	0.065	<0.005
	03/15/23	0.231	<0.001	<0.001	0.097	0.328	0.072	<0.005
06/23/23	0.084	<0.002	<0.002	0.046	0.130	0.039	<0.010	
09/11/23	0.116	<0.001	<0.001	0.056	0.172	0.045	<0.005	
12/11/23	0.129	<0.001	<0.001	0.073	0.202	0.054	<0.005	
<b>GRP Values (Source)</b>		<b>0.4658</b>	<b>93.15</b>	<b>65.21</b>	<b>175</b>	<b>--</b>	<b>1.863</b>	<b>1.863</b>

**TABLE 3  
GROUNDWATER ANALYTICAL SUMMARY  
HIGHWAY 46 FUEL CENTER  
HEFLIN, ALABAMA**

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPHTHALENE (mg/L)
MW-3	01/29/18	<b>5.680</b>	2.810	0.955	5.730	15.175	<b>3.610</b>	0.090
	12/10/18	<b>5.550</b>	2.330	0.965	4.800	13.645	<b>3.670</b>	0.161
	06/06/19	<b>6.400</b>	4.320	1.120	5.350	17.190	<b>3.240</b>	0.162
	09/06/19	<b>6.490</b>	1.310	0.948	5.030	13.778	<b>3.640</b>	0.152
	12/16/19	<b>6.430</b>	0.710	1.190	5.700	14.030	<b>2.770</b>	0.087
	03/12/20	<b>8.700</b>	13.400	1.780	9.450	33.330	<b>3.550</b>	0.276
	08/05/20	<b>6.310</b>	5.610	1.640	7.590	21.150	<b>3.020</b>	0.063
	11/04/20	<b>6.960</b>	3.670	1.640	8.210	20.480	<b>3.040</b>	0.268
	02/12/21	<b>7.540</b>	3.670	1.680	7.420	20.310	<b>3.190</b>	0.102
	05/05/21	<b>8.370</b>	5.570	1.830	8.310	24.080	<b>2.690</b>	0.210
	08/03/21	<b>6.710</b>	3.390	1.540	5.740	17.380	<b>2.990</b>	0.113
	11/15/21	<b>0.495</b>	0.154	0.098	0.336	1.083	0.252	0.017
	02/03/22	<b>3.560</b>	1.470	0.839	3.050	8.919	1.620	0.204
	05/02/22	<b>5.500</b>	2.310	1.260	3.740	12.810	<b>2.920</b>	0.313
	09/19/22	<b>2.250</b>	0.111	0.520	1.000	3.881	<b>2.060</b>	0.119
	12/13/22	<b>2.430</b>	0.087	0.500	0.704	3.721	<b>2.590</b>	0.128
	03/15/23	<b>2.960</b>	0.454	0.610	1.520	5.544	<b>1.970</b>	0.204
06/23/23	<b>2.060</b>	0.370	0.540	1.380	4.350	<b>1.960</b>	0.202	
09/11/23	<b>1.250</b>	0.212	0.552	0.732	2.746	<b>2.440</b>	0.137	
12/11/23	<b>0.886</b>	0.032	0.154	0.339	1.411	1.490	0.053	
<b>GRP Values (Source)</b>		<b>0.4658</b>	<b>93.15</b>	<b>65.21</b>	<b>175</b>	<b>--</b>	<b>1.863</b>	<b>1.863</b>
MW-4	01/29/18	0.082	0.003	0.002	0.149	0.236	0.310	0.011
	12/10/18	0.102	<0.002	<0.002	0.166	0.268	0.310	0.027
	06/06/19	0.049	<0.001	<0.001	0.071	0.120	0.105	0.008
	09/06/19	0.134	0.001	0.001	0.193	0.329	0.282	0.025
	12/16/19	0.131	<0.001	0.001	0.194	0.326	0.310	0.028
	03/12/20	0.118	<0.001	0.001	0.204	0.323	0.349	0.029
	08/05/20	0.031	<0.001	<0.001	0.066	0.097	0.087	0.008
	11/04/20	0.072	<0.001	<0.001	0.160	0.232	0.198	0.021
	02/12/21	0.055	<0.001	<0.001	0.114	0.169	0.164	0.016
	05/05/21	0.058	<0.001	<0.001	0.118	0.176	0.157	0.017
	08/03/21	0.041	<0.001	<0.001	0.102	0.143	0.182	0.018
	11/15/21	0.037	<0.001	<0.001	0.108	0.145	0.148	0.018
	02/03/22	0.013	<0.001	<0.001	0.033	0.046	0.055	<0.005
	05/02/22	0.041	<0.001	<0.001	0.109	0.150	0.196	0.016
	09/19/22	0.057	<0.001	<0.001	0.164	0.221	0.196	0.033
	12/13/22	0.076	<0.001	<0.001	0.171	0.247	0.245	0.029
	03/15/23	0.004	<0.001	<0.001	0.010	0.014	0.040	<0.005
06/23/23	0.006	<0.001	<0.001	0.018	0.024	0.077	0.005	
09/11/23	0.010	<0.001	<0.001	0.015	0.025	0.053	<0.005	
12/11/23	0.019	<0.001	<0.001	0.025	0.044	0.064	0.007	
<b>GRP Values (POC)</b>		<b>0.3734</b>	<b>74.67</b>	<b>52.27</b>	<b>175</b>	<b>--</b>	<b>1.493</b>	<b>1.493</b>

**TABLE 3**  
**GROUNDWATER ANALYTICAL SUMMARY**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPHTHALENE (mg/L)
MW-5	12/10/18	0.021	<0.001	<0.001	0.008	0.029	0.045	<0.005
	06/06/19	0.003	<0.001	<0.001	0.004	0.007	0.070	<0.005
	09/06/19	<0.001	<0.001	<0.001	<0.003	BDL	0.049	<0.005
	12/16/19	0.001	<0.001	<0.001	<0.003	0.001	0.036	<0.005
	03/12/20	<0.001	<0.001	<0.001	<0.003	BDL	0.026	<0.005
	08/05/20	<0.001	<0.001	<0.001	<0.003	BDL	0.033	<0.005
	11/04/20	<0.001	<0.001	<0.001	<0.003	BDL	0.027	<0.005
	02/12/21	<0.001	<0.001	<0.001	<0.003	BDL	0.016	<0.005
	05/05/21	<0.001	<0.001	<0.001	<0.003	BDL	0.012	<0.005
	08/03/21	<0.001	<0.001	<0.001	<0.003	BDL	0.012	<0.005
	11/15/21	<0.001	<0.001	<0.001	<0.003	BDL	0.017	<0.005
	02/03/22	<0.001	0.002	<0.001	<0.003	0.002	0.013	<0.005
	05/02/22	<0.001	0.002	<0.001	0.004	0.006	0.018	<0.005
	09/19/22	<0.001	<0.001	<0.001	<0.003	BDL	0.004	<0.005
	12/13/22	<0.001	<0.001	<0.001	<0.003	BDL	0.013	<0.005
	03/15/23	<0.001	<0.001	<0.001	<0.003	BDL	0.013	<0.005
06/23/23	<0.001	<0.001	<0.001	<0.003	BDL	0.012	<0.005	
09/11/23	<0.001	<0.001	<0.001	<0.003	BDL	0.009	<0.005	
12/11/23	0.002	0.018	0.008	0.050	0.078	0.007	0.024	
<b>GRP Values (Source)</b>		<b>0.4658</b>	<b>93.15</b>	<b>65.21</b>	<b>175</b>	<b>--</b>	<b>1.863</b>	<b>1.863</b>
MW-6	12/10/18	0.001	<0.001	<0.001	<0.003	0.001	0.009	<0.005
	06/06/19	<b>0.025</b>	<0.001	<0.001	<0.003	0.025	0.006	<0.005
	09/06/19	<b>0.025</b>	<0.001	<0.001	<0.003	0.025	0.005	<0.005
	12/16/19	0.011	<0.001	<0.001	<0.003	0.011	0.004	<0.005
	03/12/20	0.003	<0.001	<0.001	<0.003	0.003	0.002	<0.005
	08/05/20	0.002	<0.001	<0.001	<0.003	0.002	0.003	<0.005
	11/04/20	0.008	<0.001	<0.001	<0.003	0.008	0.002	<0.005
	02/12/21	0.001	<0.001	<0.001	<0.003	0.001	0.001	<0.005
	05/05/21	<0.001	<0.001	<0.001	<0.003	BDL	0.001	<0.005
Monitoring well destroyed by construction activities.								
<b>GRP Values (POC)</b>		<b>0.0223</b>	<b>4.462</b>	<b>3.123</b>	<b>44.62</b>	<b>--</b>	<b>0.0892</b>	<b>0.0892</b>
MW-7	12/10/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/06/19	NS	NS	NS	NS	NS	NS	NS
	09/06/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/16/19	NS	NS	NS	NS	NS	NS	NS
	03/12/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/05/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/04/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/12/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/05/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
Monitoring well destroyed by construction activities.								
<b>GRP Values (POC)</b>		<b>0.0144</b>	<b>2.879</b>	<b>2.015</b>	<b>28.79</b>	<b>--</b>	<b>0.0576</b>	<b>0.0576</b>

**TABLE 3**  
**GROUNDWATER ANALYTICAL SUMMARY**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPHTHALENE (mg/L)
MW-8	12/10/18	NS	NS	NS	NS	NS	NS	NS
	06/06/19	0.067	<0.001	<0.001	0.026	0.093	0.080	<0.005
	09/06/19	0.068	<0.001	<0.001	0.025	0.093	0.084	<0.005
	12/16/19	0.069	<0.001	<0.001	0.026	0.095	0.078	<0.005
	03/12/20	0.051	<0.001	<0.001	0.020	0.071	0.065	<0.005
	08/05/20	0.031	<0.001	<0.001	0.016	0.047	0.052	<0.005
	11/04/20	0.030	<0.001	<0.001	0.014	0.044	0.051	<0.005
	02/12/21	NS	NS	NS	NS	NS	NS	NS
	05/05/21	0.009	<0.001	<0.001	0.003	0.012	0.011	<0.005
	08/03/21	0.027	<0.001	<0.001	0.012	0.039	0.051	<0.005
	11/15/21	0.026	<0.001	<0.001	0.014	0.040	0.051	<0.005
	02/03/22	0.029	<0.001	<0.001	0.012	0.041	0.052	<0.005
	05/02/22	0.039	<0.001	<0.001	0.016	0.055	0.076	<0.005
	09/19/22	0.018	<0.001	<0.001	0.009	0.027	0.033	<0.005
	12/13/22	0.025	<0.001	<0.001	0.010	0.035	0.047	<0.005
	03/15/23	0.022	<0.001	<0.001	0.010	0.032	0.045	<0.005
06/23/23	0.017	<0.001	<0.001	0.008	0.025	0.041	<0.005	
09/11/23	0.021	<0.001	<0.001	0.011	0.032	0.052	<0.005	
12/11/23	0.019	<0.001	<0.001	0.010	0.029	0.042	0.010	
<b>GRP Values (POC)</b>		<b>0.3733</b>	<b>74.67</b>	<b>52.27</b>	<b>175</b>	<b>--</b>	<b>1.493</b>	<b>1.493</b>
MW-9	12/10/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/06/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/06/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/16/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/12/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/05/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/04/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/12/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/05/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/03/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/15/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/03/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/02/22	<0.001	<0.001	<0.001	<0.003	BDL	0.001	<0.005
	09/19/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/13/22	<0.001	<0.001	<0.001	<0.003	BDL	0.001	<0.005
	03/15/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
06/23/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005	
09/11/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005	
12/11/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005	
<b>GRP Values (POC)</b>		<b>0.0912</b>	<b>18.23</b>	<b>12.76</b>	<b>175</b>	<b>--</b>	<b>0.3647</b>	<b>0.3647</b>



**TABLE 3  
GROUNDWATER ANALYTICAL SUMMARY  
HIGHWAY 46 FUEL CENTER  
HEFLIN, ALABAMA**

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPHTHALENE (mg/L)
MW-10	12/10/18	<0.001	<0.001	<0.001	<0.003	BDL	0.013	<0.005
	06/06/19	<0.001	<0.001	<0.001	<0.003	BDL	0.010	<0.005
	09/06/19	0.002	<0.001	<0.001	<0.003	0.002	0.020	<0.005
	12/16/19	0.004	<0.001	<0.001	0.004	0.008	0.023	<0.005
	03/12/20	0.003	<0.001	<0.001	<0.003	0.003	0.021	<0.005
	08/05/20	0.002	<0.001	<0.001	<0.003	0.002	0.019	<0.005
	11/04/20	0.004	<0.001	<0.001	0.006	0.010	0.039	<0.005
	02/12/21	0.007	<0.001	<0.001	0.006	0.013	0.062	<0.005
	05/05/21	0.003	<0.001	<0.001	0.004	0.007	0.036	<0.005
	08/03/21	0.001	<0.001	<0.001	<0.003	0.001	0.040	<0.005
	11/15/21	0.002	<0.001	<0.001	0.003	0.005	0.054	<0.005
	02/03/22	0.003	<0.001	<0.001	0.004	0.007	0.070	<0.005
	05/02/22	0.001	<0.001	<0.001	<0.003	0.001	0.053	<0.005
	09/19/22	0.004	<0.001	<0.001	0.008	0.012	0.062	<0.005
	12/13/22	0.009	<0.001	<0.001	0.012	0.021	0.089	<0.005
	03/15/23	0.006	<0.001	<0.001	0.008	0.014	0.062	<0.005
06/23/23	0.003	<0.001	<0.001	0.004	0.007	0.060	<0.005	
09/11/23	0.005	<0.001	<0.001	0.008	0.013	0.075	<0.005	
12/11/23	0.007	<0.001	<0.001	0.011	0.018	0.071	<0.005	
<b>GRP Values (POC)</b>		<b>0.0853</b>	<b>17.05</b>	<b>11.94</b>	<b>170.5</b>	<b>--</b>	<b>0.3410</b>	<b>0.3410</b>
MW-11	12/10/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/06/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/06/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/16/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/12/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/05/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/04/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/12/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/05/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/03/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/15/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/03/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/19/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/13/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/15/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
06/23/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005	
09/11/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005	
12/11/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005	
<b>GRP Values (POC)</b>		<b>0.0899</b>	<b>17.99</b>	<b>12.59</b>	<b>175</b>	<b>--</b>	<b>0.3598</b>	<b>0.3598</b>

**TABLE 3**  
**GROUNDWATER ANALYTICAL SUMMARY**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPHTHALENE (mg/L)
MW-12	12/10/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/06/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/06/19	0.001	<0.001	<0.001	<0.003	0.001	<0.001	<0.005
	12/16/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/12/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/05/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/04/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/12/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/05/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/03/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/15/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/03/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/19/22	0.001	<0.001	<0.001	<0.003	0.001	<0.001	<0.005
	12/13/22	0.003	<0.001	<0.001	<0.003	0.003	<0.001	<0.005
03/15/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005	
06/23/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005	
09/11/23	0.003	<0.001	<0.001	<0.003	0.003	<0.001	<0.005	
12/11/23	0.013	<0.001	<0.001	0.005	0.018	<0.001	<0.005	
<b>GRP Values (POC)</b>		<b>0.1940</b>	<b>38.80</b>	<b>27.16</b>	<b>175</b>	<b>--</b>	<b>0.7760</b>	<b>0.7760</b>
RW-1	08/05/20	0.022	<0.001	<0.001	0.017	0.039	0.353	<0.005
	11/04/20	0.017	<0.001	<0.001	0.018	0.035	0.276	<0.005
	02/12/21	0.013	<0.001	<0.001	0.014	0.027	0.436	<0.005
	05/05/21	0.093	<0.001	<0.001	0.046	0.139	0.390	0.020
	08/03/21	0.192	<0.005	<0.005	0.054	0.246	0.600	0.010
	11/15/21	0.062	<0.001	<0.001	0.045	0.107	0.508	0.014
	02/03/22	0.020	<0.001	<0.001	0.032	0.052	0.674	0.006
	05/02/22	0.191	0.001	<0.010	0.053	0.245	0.946	<0.050
	09/19/22	0.056	<0.001	<0.001	0.032	0.088	0.468	0.014
	12/13/22	0.137	<0.005	<0.005	0.039	0.176	0.775	<0.025
	03/15/23	0.006	<0.001	<0.001	<0.003	0.006	0.422	<0.005
	06/23/23	<0.005	<0.005	<0.005	<0.015	BDL	0.382	<0.025
09/11/23	0.010	<0.001	<0.001	0.005	0.015	0.635	<0.005	
12/11/23	0.004	0.001	<0.001	0.007	0.012	0.510	<0.005	
<b>GRP Values (MW-1)</b>		<b>0.4658</b>	<b>93.15</b>	<b>65.21</b>	<b>175</b>	<b>--</b>	<b>1.863</b>	<b>1.863</b>
RW-2	08/05/20	<b>1.950</b>	1.57	0.61	2.370	6.498	1.600	<0.500
	11/04/20	0.293	0.076	0.076	0.147	0.592	0.250	0.018
	02/12/21	0.011	0.003	0.002	0.003	0.019	0.012	<0.005
	05/05/21	0.162	0.034	0.043	0.059	0.298	0.163	0.013
	08/03/21	<b>1.100</b>	0.376	0.304	0.528	2.308	0.816	0.091
	11/15/21	<b>1.680</b>	0.410	0.226	0.586	2.902	<b>2.300</b>	0.137
	02/03/22	0.019	0.004	0.003	0.010	0.036	0.012	<0.005
	05/02/22	<b>3.790</b>	2.150	0.610	2.290	8.840	<b>3.580</b>	0.279
	09/19/22	<b>0.575</b>	0.324	0.157	0.490	1.546	<b>2.290</b>	0.169
	12/13/22	<b>1.020</b>	0.117	0.288	0.171	1.596	<b>2.880</b>	0.141
	03/15/23	<b>2.340</b>	0.254	0.512	1.270	4.376	<b>2.100</b>	0.238
	06/23/23	<b>1.900</b>	0.212	0.514	1.500	4.126	<b>2.420</b>	0.336
09/11/23	0.245	0.006	0.099	0.037	0.387	<b>2.460</b>	0.074	
12/11/23	0.199	0.009	0.061	0.038	0.307	<b>2.120</b>	0.047	
<b>GRP Values (MW-3)</b>		<b>0.4658</b>	<b>93.15</b>	<b>65.21</b>	<b>175</b>	<b>--</b>	<b>1.863</b>	<b>1.863</b>

**TABLE 3  
GROUNDWATER ANALYTICAL SUMMARY  
HIGHWAY 46 FUEL CENTER  
HEFLIN, ALABAMA**

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPHTHALENE (mg/L)
RW-3	08/05/20	0.047	<0.001	0.001	0.145	0.193	0.315	0.034
	11/04/20	0.033	<0.001	<0.001	0.152	0.185	0.166	0.037
	02/12/21	0.052	0.002	<0.001	0.223	0.277	0.168	0.061
	05/05/21	0.043	<0.001	0.001	0.160	0.204	0.169	0.042
	08/03/21	0.044	<0.005	0.001	0.212	0.257	0.274	0.053
	11/15/21	0.025	<0.001	<0.001	0.069	0.094	0.119	0.029
	02/03/22	0.014	<0.001	<0.001	0.038	0.052	0.074	0.018
	05/02/22	0.044	<0.001	<0.001	0.121	0.165	0.267	0.053
	09/19/22	0.033	0.002	0.001	0.063	0.099	0.126	0.035
	12/13/22	0.063	<0.001	<0.001	0.111	0.174	0.261	0.053
	03/15/23	0.047	<0.001	<0.001	0.158	0.205	0.244	0.067
	06/23/23	0.021	<0.005	<0.005	0.067	0.088	0.136	0.031
09/11/23	0.022	<0.001	<0.001	0.055	0.077	0.090	0.029	
12/11/23	0.039	0.004	0.001	0.025	0.069	0.234	0.011	
<b>GRP Values (MW-4)</b>		<b>0.3734</b>	<b>74.67</b>	<b>52.27</b>	<b>175</b>	<b>--</b>	<b>1.493</b>	<b>1.493</b>
<b>DUPLICATE RESULTS</b>								
DUP (MW-3)	01/29/18	5.480	2.790	0.989	5.750	15.009	3.790	0.092
DUP (MW-4)	12/10/18	0.103	<0.002	<0.002	0.164	0.267	0.308	0.026
DUP (MW-1)	06/06/19	0.043	<0.001	<0.001	0.008	0.051	0.024	<0.005
DUP (MW-2)	09/06/19	0.115	<0.001	<0.001	0.049	0.164	0.032	<0.005
DUP (MW-4)	12/16/19	0.133	<0.001	<0.001	0.195	0.328	0.304	0.027
DUP (MW-2)	03/12/20	0.148	<0.001	<0.001	0.066	0.214	0.043	<0.005
DUP (MW-1)	08/05/20	0.032	<0.001	<0.001	0.011	0.043	0.023	<0.005
DUP (RW-1)	11/04/20	0.018	<0.001	<0.001	0.018	0.036	0.294	<0.005
DUP (RW-2)	02/12/21	0.011	0.003	0.002	0.004	0.020	0.012	<0.005
DUP (RW-3)	05/05/21	0.042	<0.001	0.001	0.154	0.197	0.173	0.042
DUP (MW-4)	08/03/21	0.044	<0.001	<0.001	0.103	0.147	0.187	0.021
DUP (RW-2)	11/15/21	1.710	0.414	0.222	0.580	2.926	2.300	0.130
DUP (MW-3)	02/03/22	3.320	1.430	0.740	2.630	8.120	1.390	0.218
DUP (RW-2)	05/02/22	3.890	2.180	0.600	2.230	8.900	3.730	0.236
DUP (MW-3)	09/19/22	2.330	0.114	0.512	0.976	3.932	2.080	0.114
DUP (RW-2)	12/13/22	0.938	0.119	0.298	0.180	1.535	2.760	0.165
DUP (MW-3)	03/15/23	3.140	0.506	0.652	1.700	5.998	1.900	0.230
DUP (RW-2)	06/23/23	1.930	0.193	0.522	1.510	4.155	2.400	0.348
DUP (MW-2)	09/11/23	0.115	<0.001	<0.001	0.056	0.171	0.045	<0.005
DUP (MW-1)	12/11/23	0.029	<0.001	<0.001	0.020	0.049	0.062	<0.005

Notes: mg/L - milligrams per liter  
BDL - below detection limits  
BTEX/MTBE/Naphthalene analyses conducted per EPA Method 8260  
GRP - Groundwater Resource Protection  
POC - Point of Compliance  
**Bold** indicates concentration exceeds SSCAL  
The data for RW-1 and RW-2 on 08/05/20 appear to have been swapped; therefore, the results were changed to be more accurate.

Source: PPM Consultants, Inc.  
PPM Project No.: 455401-MCAP

**TABLE 4**  
**INTRINSIC GROUNDWATER PARAMETERS**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

WELL I.D.	DATE	pH (S.U.)	TEMPERATURE (°C)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)	OXIDATION REDUCTION POTENTIAL (mV)
MW-1	08/05/20	5.35	22.7	NM	4.56	272
	11/04/20	3.74	20.4	59	2.00	350.6
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	3.92	22.0	37	1.89	209.1
	08/03/21	3.80	21.4	37	0.58	169.6
	11/15/21	3.22	19.0	57	12.54	90.7
	02/03/22	3.53	19.4	NM	0.95	212.7
	05/02/22	4.99	22.7	329	1.22	196.9
	09/19/22	4.95	25.3	41	0.32	109.6
	12/13/22	3.91	18.0	41	1.39	104.3
	03/15/23	5.17	19.6	61	1.61	57.2
	06/23/23	4.71	22.3	45	1.27	190.6
09/11/23	4.72	20.8	40	1.21	242.5	
12/11/23	4.08	19.0	43	NM	340.4	
MW-2	08/05/20	5.42	23.2	NM	1.59	96
	11/04/20	3.43	20.6	49	1.46	317.2
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	3.79	21.5	26	0.91	198.7
	08/03/21	3.99	21.3	34	1.24	159.0
	11/15/21	2.80	18.8	53	12.74	107.4
	02/03/22	3.59	19.3	NM	0.99	217.9
	05/02/22	4.66	21.5	302	0.89	252.0
	09/19/22	5.25	22.6	36	1.14	60.9
	12/13/22	3.66	18.4	32	0.99	96.5
	03/15/23	4.35	18.9	50	1.87	39.9
	06/23/23	4.69	22.7	21	0.89	183.7
09/11/23	4.90	21.4	35	1.81	210.8	
12/11/23	4.27	18.6	31	NM	323.9	
MW-3	08/05/20	5.68	23.3	NM	1.74	37
	11/04/20	4.95	21.6	185	1.00	231.1
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	5.10	22.8	168	1.05	159.7
	08/03/21	4.93	22.1	212	1.79	142.5
	11/15/21	5.66	19.5	321	11.96	125.1
	02/03/22	4.81	19.8	NM	2.06	97.8
	05/02/22	5.81	22.8	225	0.88	-13
	09/19/22	5.60	23.5	179	0.93	60.1
	12/13/22	5.61	19.3	174	0.74	72.5
	03/15/23	5.12	18.8	312	2.33	41.8
	06/23/23	5.85	21.2	276	1.02	87.5
09/11/23	4.78	21.9	258	1.40	238.5	
12/11/23	5.43	19.3	151	NM	167.6	

**TABLE 4**  
**INTRINSIC GROUNDWATER PARAMETERS**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

WELL I.D.	DATE	pH (S.U.)	TEMPERATURE (°C)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)	OXIDATION REDUCTION POTENTIAL (mV)
MW-4	08/05/20	7.07	23.0	NM	3.31	229
	11/04/20	3.83	21.1	141	1.48	297.1
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	4.06	21.5	92	1.94	183.6
	08/03/21	4.14	22.0	103	1.46	148.1
	11/15/21	1.98	19.6	124	1.84	53.8
	02/03/22	4.37	19.1	NM	3.75	95.1
	05/02/22	4.80	22.5	96	0.84	143.9
	09/19/22	5.06	25.7	87	1.13	67.5
	12/13/22	4.97	19.4	101	1.27	68.5
	03/15/23	3.91	16.3	180	1.96	92.0
	06/23/23	5.62	21.1	134	2.34	118.5
	09/11/23	4.82	22.6	88	1.03	268.6
12/11/23	5.12	18.7	100	NM	234.0	
MW-5	08/05/20	5.67	22.8	NM	10.38	256
	11/04/20	5.95	19.4	401	2.56	250.6
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	6.17	20.5	298	3.56	182.4
	08/03/21	5.56	20.2	325	0.90	136.2
	11/15/21	5.10	18.3	589	1.39	81.0
	02/03/22	3.75	19.0	NM	1.09	96.6
	05/02/22	6.58	23.8	303	2.92	171.3
	09/19/22	6.27	23.4	356	1.44	132.8
	12/13/22	4.85	17.7	288	1.42	99.6
	03/15/23	6.06	18.6	402	3.60	72.9
	06/23/23	6.63	22.2	357	2.10	56.0
	09/11/23	4.77	21.5	272	3.20	257.4
12/11/23	6.83	19.2	293	NM	95.5	
MW-6	08/05/20	5.79	22.2	NM	4.11	181
	11/04/20	5.01	19.8	68	3.18	309.2
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	4.10	19.3	61	1.59	334.7
Monitoring well destroyed by construction activities.						
MW-7	08/05/20	6.31	23.2	NM	6.21	83
	11/04/20	4.26	19.4	52	6.64	329.5
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	4.15	19.5	31	5.91	301.2
Monitoring well destroyed by construction activities.						
MW-8	08/05/20	5.39	23.1	NM	5.94	245
	11/04/20	5.26	20.3	226	2.18	293.2
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	5.10	21.4	159	4.18	189.7
	08/03/21	4.60	22.1	158	1.29	163.1
	11/15/21	4.76	18.1	169	13.51	88.7
	02/03/22	4.18	19.1	NM	1.49	237.1
	05/02/22	4.95	22.8	126	1.45	154.7
	09/19/22	6.25	22.3	158	1.12	104.9
	12/13/22	4.04	18.6	112	1.96	98.4
	03/15/23	6.83	17.6	237	2.56	72.8
	06/23/23	5.36	22.7	150	2.16	144.8
	09/11/23	4.50	21.2	92	1.90	294.2
12/11/23	4.46	17.8	96	NM	328.9	

**TABLE 4**  
**INTRINSIC GROUNDWATER PARAMETERS**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

WELL I.D.	DATE	pH (S.U.)	TEMPERATURE (°C)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)	OXIDATION REDUCTION POTENTIAL (mV)
MW-9	08/05/20	6.22	25.3	NM	1.56	222
	11/04/20	4.27	21.3	254	2.32	280.4
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	4.48	22.0	186	3.26	196.3
	08/03/21	4.52	25.6	200	1.35	201.2
	11/15/21	6.69	18.5	172	4.72	95.8
	02/03/22	4.02	19.2	NM	1.43	253.7
	05/02/22	4.30	23.5	167	1.29	221.8
	09/19/22	5.75	26.8	496	2.48	169.4
	12/13/22	3.96	18.4	148	2.54	97.5
	03/15/23	4.68	19.2	211	2.57	44.2
	06/23/23	4.40	22.8	232	1.11	204.6
	09/11/23	4.33	22.2	171	3.06	306.9
12/11/23	4.35	17.3	200	NM	294.1	
MW-10	08/05/20	4.96	23.4	NM	2.99	247
	11/04/20	3.71	21.2	68	1.96	330.1
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	3.69	21.6	39	1.33	221.5
	08/03/21	3.77	22.8	49	1.48	171.9
	11/15/21	4.46	18.3	64	13.19	88.8
	02/03/22	4.06	19.1	NM	0.98	216.9
	05/02/22	4.76	24.6	50	1.54	183.3
	09/19/22	4.85	24.0	43	1.06	88.1
	12/13/22	3.51	18.2	39	2.90	118.2
	03/15/23	3.61	17.6	70	2.11	82.0
	06/23/23	5.63	22.1	82	1.37	103.8
	09/11/23	4.80	22.3	45	2.40	273.3
12/11/23	3.91	19.1	56	NM	302.0	
MW-11	08/05/20	5.98	21.7	NM	2.85	213
	11/04/20	4.33	20.4	182	2.99	247.1
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	3.79	20.0	125	3.20	211.4
	08/03/21	3.66	19.4	134	1.34	169.7
	11/15/21	2.95	17.8	264	13.93	51.4
	02/03/22	3.42	17.5	NM	2.09	227.0
	05/02/22	4.01	20.8	127	1.13	266.4
	09/19/22	4.41	22.4	124	2.22	158.8
	12/13/22	3.19	18.6	131	2.81	137.7
	03/15/23	3.69	17.2	186	1.96	85.9
	06/23/23	5.28	19.7	183	4.05	154.5
	09/11/23	6.42	23.1	135	7.47	249.0
12/11/23	4.16	17.0	128	NM	249.7	



**TABLE 4**  
**INTRINSIC GROUNDWATER PARAMETERS**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

WELL I.D.	DATE	pH (S.U.)	TEMPERATURE (°C)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)	OXIDATION REDUCTION POTENTIAL (mV)
MW-12	08/05/20	4.77	22.7	NM	4.36	253
	11/04/20	3.49	21.5	45	4.11	348.1
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	3.96	21.4	22	3.80	189.1
	08/03/21	3.61	21.7	25	3.78	170.2
	11/15/21	2.47	19.4	42	12.15	102.5
	02/03/22	5.29	17.9	NM	2.11	44.4
	05/02/22	4.58	23.0	24	3.61	411.7
	09/19/22	5.66	22.9	29	0.49	19.5
	12/13/22	3.56	17.8	22	3.04	108.7
	03/15/23	3.27	20.7	36	4.34	76.8
	06/23/23	5.09	21.2	32	3.34	153.0
	09/11/23	7.44	22.8	138	5.30	232.6
12/11/23	4.19	19.2	20	NM	337.9	
RW-1	08/05/20	5.66	23.6	NM	3.88	149
	11/04/20	4.84	21.4	155	2.52	304.9
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	4.53	21.1	64	1.65	185.0
	08/03/21	4.60	21.4	86	2.14	157.1
	11/15/21	NM	18.8	87	NM	76.3
	02/03/22	3.96	19.0	NM	1.06	269.7
	05/02/22	5.22	20.9	67	2.08	126.1
	09/19/22	5.61	24.6	116	1.71	91.1
	12/13/22	5.96	17.2	128	3.71	118.0
	03/15/23	4.77	19.4	95	3.28	65.9
	06/23/23	7.61	22.6	187	1.84	110.6
	09/11/23	4.40	21.2	79	1.81	291.0
12/11/23	5.31	18.6	97	NM	108.9	
RW-2	08/05/20	5.75	25.0	NM	1.42	43
	11/04/20	5.24	21.6	209	1.18	321.3
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	6.00	22.2	191	2.58	142.2
	08/03/21	5.01	22.1	232	0.96	144.3
	11/15/21	7.76	19.1	369	12.33	77.4
	02/03/22	5.01	19.0	NM	1.45	215.9
	05/02/22	6.00	23.1	261	1.33	106.9
	09/19/22	5.54	25.3	280	0.52	22.2
	12/13/22	5.81	17.6	287	2.18	62.9
	03/15/23	5.37	20.9	374	4.01	35.2
	06/23/23	6.34	22.0	211	0.97	72.1
	09/11/23	5.12	21.7	237	1.63	200.3
12/11/23	5.63	19.8	183	NM	123.0	

**TABLE 4**  
**INTRINSIC GROUNDWATER PARAMETERS**  
**HIGHWAY 46 FUEL CENTER**  
**HEFLIN, ALABAMA**

WELL I.D.	DATE	pH (S.U.)	TEMPERATURE (°C)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)	OXIDATION REDUCTION POTENTIAL (mV)
RW-3	08/05/20	5.50	22.8	NM	1.89	323
	11/04/20	4.94	20.8	291	2.23	291.9
	02/12/21	NM	NM	NM	NM	NM
	05/05/21	5.45	21.8	187	2.36	175.7
	08/03/21	4.85	22.1	223	1.51	189.3
	11/15/21	5.76	19.2	318	12.35	82.7
	02/03/22	5.03	18.9	NM	2.08	216.1
	05/02/22	5.65	23.2	196	1.38	114.9
	09/19/22	5.75	22.7	177	1.00	21.1
	12/13/22	5.55	18.7	180	2.60	63.6
	03/15/23	4.26	17.7	247	1.60	59.8
	06/23/23	6.40	21.2	260	0.55	141.7
	09/11/23	5.02	21.6	85	1.30	242.9
12/11/23	5.92	18.8	190	NM	109.3	

Notes:                    S.U. - Standard Units  
                              °C - degrees Celsius  
                              µS/cm - microSiemens per centimeter  
                              mg/L - milligrams per liter  
                              mV - millivolts  
                              NM - Not Measured

Source:                    PPM Consultants, Inc.  
                              PPM Project No. 455401-MCAP

## **APPENDICES**

**APPENDIX A – SOIL BORING/MONITORING WELL CONSTRUCTION LOGS**



# LOG OF BORING: SB-1/MW-1

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highway 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-PI  
 Project Type: Preliminary Investigation

### Boring Information:

Date / Time: 1-22-18 / 10:05  
 Logged By: CG  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 38.0 ft BGS  
 Initial Saturation (ft)/Date: 36.0 ft BGS (1-22-18)  
 Static GW level (ft)/Date: 32.74 ft BTOC (1-29-18)  
 Surface Elevation (ft): 1,000.3 ft  
 Sampling Interval: Continuous

### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 1-22-18  
 Total Well Depth: 38.1 ft BTOC  
 Screened Interval: 28.0 ft - 37.4 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Bailer  
 Gallons Purged: 13 gal

Depth in Feet	Surf. Elev. 1000.3	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: MW-1
					Water Levels ▼ Static GW level ▽ Initial Saturation						
0	1000				CLAY, no plasticity, soft, homogenous, moist, tan, no odor	1	N/A	0	100%	0	Manhole Cover TOC Elev. 1,000.00
5	995				CLAY, no plasticity, hard, homogenous, moist, orangish brown, no odor	2	N/A	0	90%	5	
					CLAY, no plasticity, soft, moist, brown, tan and gray mottled, no odor	3	N/A	0	50%		
					Same as above	4	N/A	0	50%		
10	990		CL		SILTY CLAY, no plasticity, soft, moist, tan and gray mottled, no odor	5	N/A	0	60%	10	
					SANDY CLAY, no plasticity, soft, reddish brown, gray mottled, no odor, sand is fine, subangular	6	N/A	0	30%		
					SANDY CLAY, no plasticity, soft, moist, brown, black mottled, no odor, sand is fine, subangular	7	N/A	0	50%		
15	985				SANDY CLAY, no plasticity, soft to firm, homogenous, moist, orangish brown, no odor, sand is fine, subangular	8	N/A	0	50%	15	
					SANDY CLAY, no plasticity, soft to firm, moist, orangish brown, light gray mottled, no odor, sand is fine, subangular	9	N/A	0	50%		
					SANDY CLAY, no plasticity, soft to firm, reddish brown, light gray mottled, no odor, sand is fine, subangular	10	N/A	0	90%		
20	980				CLAYEY SAND, well graded, fine, medium dense, subangular, moist, reddish brown, no odor	11	N/A	0*	70%	20	
					Same as above	12	N/A	0	50%		
			SC		CLAYEY SAND, fine, medium dense, subangular, moist, reddish brown, no odor	13	N/A	0	100%		
					Same as above	14	N/A	0	50%		
25	975				SANDY CLAY, no plasticity, firm, moist, brown, light gray mottled, no odor, sand is fine, subangular	15	N/A	0	40%	25	Bentonite Seal
					SANDY CLAY, no plasticity, firm, homogenous, moist, tan, no odor, sand is fine, subangular	16	N/A	0	50%		
					SILTY CLAY, no plasticity, soft, moist, brown, reddish brown mottled, no odor	17	N/A	0*	30%		
30	970		CL		SANDY CLAY, no plasticity, soft, homogenous, saturated, brown, no odor	18	N/A	0	10%	30	Flush Threaded Joint Top Screen Elev. 972.0 20/40 Well Rounded Silica Sand
											2" I.D. Slotted PVC Screen
35	965									35	Bottom Screen Elev. 962.6 Threaded Bottom Plug
40					(Boring terminated @ 38.0 ft BGS)					40	

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highway 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-PI  
 Project Type: Preliminary Investigation

### Boring Information:

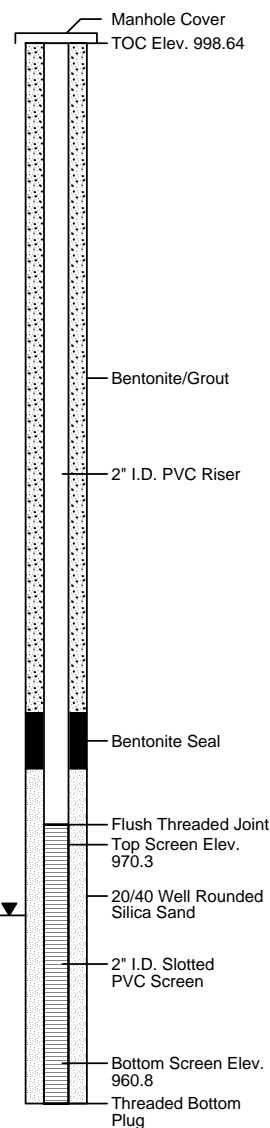
Date / Time: 1-23-18 / 06:50  
 Logged By: CG  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 38.0 ft BGS  
 Initial Saturation (ft)/Date: NA  
 Static GW level (ft)/Date: 31.25 ft BTOC (1-29-18)  
 Surface Elevation (ft): 998.9 ft  
 Sampling Interval: 2 ft every 5 ft

### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 1-23-18  
 Total Well Depth: 38.4 ft BTOC  
 Screened Interval: 28.3 ft - 37.8 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 4 gal

Depth in Feet	Surf. Elev. 998.9	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
					▼ Static GW level	▽ Initial Saturation					
DESCRIPTION											
0	998				CLAY, no plasticity, firm to hard, homogenous, moist, tan, no odor		1	N/A	0	100%	0
5	993				CLAY, no plasticity, hard, homogenous, moist, tan, no odor		2	N/A	0	10%	5
10	988				SILTY CLAY, no plasticity, soft, homogenous, moist, tan, no odor		3	N/A	0	80%	10
15	983				SANDY CLAY, no plasticity, soft, moist, brown, black mottled, no odor, sand is fine, subangular		4	N/A	0*	30%	15
20	978		CL		SILTY CLAY, no plasticity, soft, laminated, reddish brown, no odor		5	N/A	0	80%	20
25	973				SANDY CLAY, no plasticity, soft, homogenous, moist, tan, no odor, sand is fine, subangular		6	N/A	0	40%	25
30	968	▼			SILTY CLAY, no plasticity, soft to firm, homogenous, moist, tan, no odor		7	N/A	0*	10%	30
35	963				SANDY CLAY, no plasticity, soft, homogenous, moist, gray, no odor, sand is fine, subangular CLAY, no plasticity, soft, homogenous, wet, light brown, no odor		8	N/A	0	40%	35
(Boring terminated @ 38.0 ft BGS)											
40											40

Well Schematic: MW-2



### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.



## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highwat 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-PI  
 Project Type: Preliminary Investigation

### Boring Information:

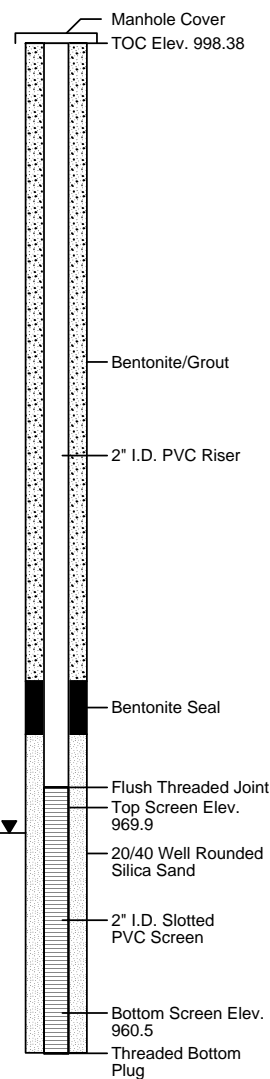
Date / Time: 1-22-18 / 14:40  
 Logged By: CG  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 38.0 ft BGS  
 Initial Saturation (ft)/Date: NA  
 Static GW level (ft)/Date: 29.71 ft BTOC (1-29-18)  
 Surface Elevation (ft): 998.6 ft  
 Sampling Interval: 2 ft every 5 ft

### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 1-22-18  
 Total Well Depth: 38.5 ft BTOC  
 Screened Interval: 28.4 ft - 37.9 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 8 gal

Depth in Feet	Surf. Elev. 998.6	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
					▼ Static GW level	▽ Initial Saturation					
DESCRIPTION											
0	998				CLAY, no plasticity, soft to firm, homogenous, moist, tan, no odor		1	N/A	0	100%	0
5	993				CLAY, no plasticity, soft, moist, tan, white mottled, no odor		2	N/A	0	30%	5
10	988				SILTY CLAY, no plasticity, soft to firm, moist, tan, white mottled, no odor		3	N/A	0	40%	10
15	983		CL		Same as above		4	N/A	0	30%	15
20	978				Same as above, slight petroleum-like odor		5	N/A	35*	40%	20
25	973				SILTY CLAY, no plasticity, soft to firm, moist, reddish brown, black and light gray mottled, strong sweet odor		6	N/A	35	40%	25
30	968	▼	SC		CLAYEY SAND, well graded, fine, medium dense, moist, tan, sweet odor		7	N/A	120*	50%	30
35	963			CL	SILTY CLAY, no plasticity, moist, reddish brown, white mottled, mild sweet odor		8	N/A	45	60%	35
40					CLAY, no plasticity, soft to firm, moist, tan, gray mottled, slight sweet odor (Boring terminated @ 38.0 ft BGS)						40

Well Schematic: MW-3



**NOTES:**

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highwat 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-PI  
 Project Type: Preliminary Investigation

### Boring Information:

Date / Time: 1-23-18 / 09:20  
 Logged By: CG  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 38.0 ft BGS  
 Initial Saturation (ft)/Date: NA  
 Static GW level (ft)/Date: 28.92 ft BTOC (1-29-18)  
 Surface Elevation (ft): 998.3 ft  
 Sampling Interval: 2 ft every 5 ft

### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 1-23-18  
 Total Well Depth: 38.5 ft BTOC  
 Screened Interval: 28.4 ft - 37.9 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 10 gal

Depth in Feet	Surf. Elev. 998.3	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: MW-4
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
0	998				CLAY, no plasticity, soft, homogenous, brown, slight petroleum-like odor		1	N/A	5	100%	0	Manhole Cover TOC Elev. 997.96
5	993				CLAY, low plasticity, firm to hard, homogenous, moist, tan, slight petroleum-like odor		2	N/A	40*	80%	5	
10	988				SANDY CLAY, no plasticity, soft, laminated, moist, tan, no odor, sand is fine, subangular		3	N/A	0	90%	10	
15	983				Same as above		4	N/A	0	40%	15	Bentonite/Grout
20	978		CL		Same as above		5	N/A	0	50%	20	2" I.D. PVC Riser
25	973				GRAVELLY SANDY CLAY, no plasticity, soft, homogenous, moist, tan, no odor, gravel is fine to medium to coarse, angular		6	N/A	0	25%	25	Bentonite Seal
30	968	▼			SANDY CLAY, no plasticity, soft, homogenous, moist, tan, no odor, sand is fine, subangular		7	N/A	0*	50%	30	Flush Threaded Joint Top Screen Elev. 969.6
35	963				SANDY CLAY, no plasticity, soft, moist to wet, brown, gray mottled, no odor, sand is fine		8	N/A	0	60%	35	20/40 Well Rounded Silica Sand
40					GRAVELLY CLAY, no plasticity, soft, homogenous, wet, brown, no odor, gravel is medium, angular						40	2" I.D. Slotted PVC Screen
(Boring terminated @ 38.0 ft BGS)												

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.



# LOG OF BORING: SB-5/MW-5

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highway 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-SI  
 Project Type: Secondary Investigation

### Boring Information:

Date / Time: 11-28-18 13:20/12-3-18 10:40  
 Logged By: AP  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: HSA / Air Rotary  
 Total Boring Depth: 75.0 ft BGS  
 Initial Saturation (ft)/Date: 38.0 ft BGS (11-28-18)  
 Static GW level (ft)/Date: 35.69 ft BTOC (12-10-18)  
 Surface Elevation (ft): 1,000.5 ft  
 Sampling Interval: NA

### Well Information:

Well Type: Type III  
 Well Purpose: Monitoring  
 Well Construction Date: 12-3-18  
 Total Well Depth: 75.6 ft BTOC  
 Screened Interval: 70.6 ft - 74.9 ft  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 8 gal

Depth in Feet	Surf. Elev. 1000.5	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: MW-5
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
0	1000				CLAY, no plasticity, soft, homogenous, moist, tan, no odor						0	<p>Manhole Cover TOC Elev. 1,000.27</p> <p>Bentonite/Grout</p> <p>2" I.D. PVC Riser</p>
5	995				CLAY, no plasticity, hard, homogenous, moist, orangish brown, no odor						5	
					CLAY, no plasticity, soft, moist, brown, tan and gray mottled, no odor							
					Same as above							
10	990		CL		SILTY CLAY, no plasticity, soft, moist, tan and gray mottled, no odor						10	
					SANDY CLAY, no plasticity, soft, reddish brown, gray mottled, no odor, sand is fine, subangular							
					SANDY CLAY, no plasticity, soft, moist, brown, black mottled, no odor, sand is fine, subangular							
15	985				SANDY CLAY, no plasticity, soft to firm, homogenous, moist, orangish brown, no odor, sand is fine, subangular						15	
					SANDY CLAY, no plasticity, soft to firm, moist, orangish brown, light gray mottled, no odor, sand is fine, subangular							
					SANDY CLAY, no plasticity, soft to firm, reddish brown, light gray mottled, no odor, sand is fine, subangular							
20	980				CLAYEY SAND, well graded, fine, medium dense, subangular, moist, reddish brown, no odor						20	
					Same as above							
			SC		CLAYEY SAND, fine, medium dense, subangular, moist, reddish brown, no odor							
					Same as above							
25	975				SANDY CLAY, no plasticity, firm, moist, brown, light gray mottled, no odor, sand is fine, subangular						25	
					SANDY CLAY, no plasticity, firm, homogenous, moist, tan, no odor, sand is fine, subangular							
					SILTY CLAY, no plasticity, soft, moist, brown, reddish brown mottled, no odor							
30	970				SANDY CLAY, no plasticity, soft, homogenous, moist, saturated, brown, no odor						30	
35	965	▼	CL								35	
		▽										
40											40	

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highwat 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-SI  
 Project Type: Secondary Investigation

### Boring Information:

Date / Time: 11-28-18 13:20/12-3-18 10:40  
 Logged By: AP  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: HSA / Air Rotary  
 Total Boring Depth: 75.0 ft BGS  
 Initial Saturation (ft)/Date: 38.0 ft BGS (11-28-18)  
 Static GW level (ft)/Date: 35.69 ft BTOC (12-10-18)  
 Surface Elevation (ft): 1,000.5 ft  
 Sampling Interval: NA

### Well Information:

Well Type: Type III  
 Well Purpose: Monitoring  
 Well Construction Date: 12-3-18  
 Total Well Depth: 75.6 ft BTOC  
 Screened Interval: 70.6 ft - 74.9 ft  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 8 gal

Depth in Feet	Surf. Elev. 1000.5	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: MW-5
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
40	960										40	
45	955										45	
50	950										50	
55	945										55	
60	940										60	
65	935										65	
70	930										70	
75	925										75	
80	920										80	
85	915										85	
90											90	

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highway 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-SI  
 Project Type: Secondary Investigation

### Boring Information:

Date / Time: 11-30-18 / 10:50  
 Logged By: AP  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 50.2 ft BGS  
 Initial Saturation (ft)/Date: NA  
 Static GW level (ft)/Date: 42.83 ft BTOC (12-10-18)  
 Surface Elevation (ft): 1,005.5 fy  
 Sampling Interval: 2 ft every 5 ft

### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 11-30-18  
 Total Well Depth: 50.6 ft BTOC  
 Screened Interval: 40.6 ft - 49.9 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 12 gal

Depth in Feet	Surf. Elev. 1005.5	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: MW-6
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
0	1005										0	Manhole Cover TOC Elev. 1,004.99
5	1000				SILT, no plasticity, firm, laminated, moist, tan, no odor		1	N/A	0*	100%	5	
10	995				SILT, no plasticity, hard, laminated, moist, tan, no odor, weathered phyllite		2	N/A	0	75%	10	
15	990				SILT, no plasticity, firm, laminated, moist, tan, no odor, weathered phyllite		3	N/A	0	50%	15	
20	985				SILT, no plasticity, firm, laminated, moist, tan/orange, no odor, weathered phyllite		4	N/A	0	80%	20	Bentonite/Grout
25	980		ML		PHYLLITE, hard, laminated, dry, tan/orange/green, no odor, very brittle, no sample		5	N/A	0	25%	25	2" I.D. PVC Riser
30	975				SILT, no plasticity, firm, laminated, moist, tan/white, no odor		6	N/A	0	100%	30	
35	970				PHYLLITE, no plasticity, hard, laminated, moist, tan/white/green, no odor, brittle		7	N/A	0	80%	35	
40	965				SILT, no plasticity, firm, laminated, moist, tan/white, no odor		8	N/A	0*	100%	40	Bentonite Seal
45	960				PHYLLITE, very hard, no plasticity, laminated, moist, tan/green/white, no odor		9	N/A	0	25%	45	Flush Threaded Joint Top Screen Elev. 964.4 20/40 Well Rounded Silica Sand
50	955				PHYLLITE, very hard, no recovery		10	N/A	0	100%	50	2" I.D. Slotted PVC Screen Bottom Screen Elev. 955.1 Threaded Bottom Plug
(Boring terminated @ 50.2 ft BGS)												

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

### CONSULTANTS

#### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highwat 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-SI  
 Project Type: Secondary Investigation

#### Boring Information:

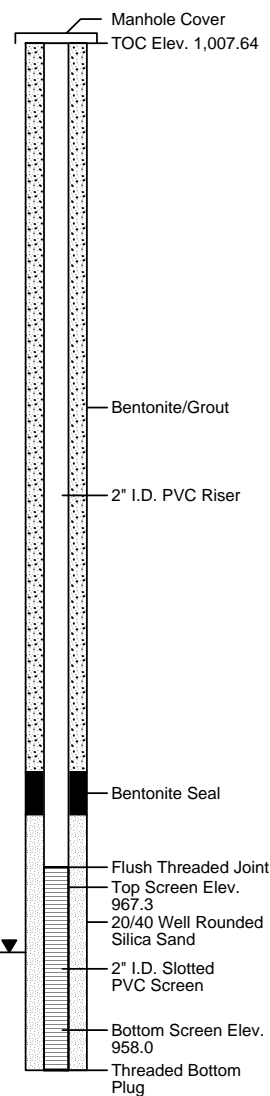
Date / Time: 11-30-18 / 07:40  
 Logged By: AP  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 50.6 ft BGS  
 Initial Saturation (ft)/Date: NA  
 Static GW level (ft)/Date: 44.80 ft BTOC (12-10-18)  
 Surface Elevation (ft): 1,007.9 ft  
 Sampling Interval: 2 ft every 5 ft

#### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 11-30-18  
 Total Well Depth: 50.3 ft BTOC  
 Screened Interval: 40.3 ft - 49.7 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 10 gal

Depth in Feet	Surf. Elev. 1007.9	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
					▼ Static GW level	▽ Initial Saturation					
DESCRIPTION											
0	1007				SILT, no plasticity, firm, homogeneous, moist, tan, no odor, weathered phyllite						0
5	1002				PHYLLITE, no plasticity, hard, laminated, moist, tan/white/green, no odor, brittle	1	N/A	0*	50%		5
10	997				SILT, no plasticity, firm, laminated, moist, tan, no odor, weathered phyllite	2	N/A	0	100%		10
15	992				SILT, no plasticity, firm, laminated, moist, tan/orange, no odor, weathered phyllite	3	N/A	0	100%		15
20	987				PHYLLITE, no plasticity, hard, laminated, moist, tan/green/orange, no odor	4	N/A	0	100%		20
25	982	ML			PHYLLITE, no plasticity, hard, laminated, moist, tan/green/orange, no odor	5	N/A	0	100%		25
30	977				PHYLLITE, no plasticity, hard, laminated, dry, tan/white/green, no odor, very brittle	6	N/A	0	75%		30
35	972				PHYLLITE, no plasticity, hard, laminated, moist, tan/white/orange, no odor	7	N/A	0	25%		35
40	967				PHYLLITE, no plasticity, firm, laminated, moist, green/orange, no odor	8	N/A	0*	75%		40
45	962	▼			PHYLLITE, very hard, no recovery No recovery						45
50	957				(Boring terminated @ 50.6 ft BGS)						50
55											55

Well Schematic: MW-7



#### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.



## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highway 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-SI  
 Project Type: Secondary Investigation

### Boring Information:

Date / Time: 11-26-18 / 10:20  
 Logged By: AP  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 45.2 ft BGS  
 Initial Saturation (ft)/Date: NA  
 Static GW level (ft)/Date: 32.91 ft BTOC (12-6-18)  
 Surface Elevation (ft): 999.8 ft  
 Sampling Interval: 2 ft every 5 ft

### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 11-26-18  
 Total Well Depth: 43.7 ft BTOC  
 Screened Interval: 35.2 ft - 44.6 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 12 gal

Depth in Feet	Surf. Elev. 999.8	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: MW-8
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
0	999				CONCRETE/GRAVEL						0	Manhole Cover TOC Elev. 999.48
5	994				GRAVELLY SILT, no plasticity, firm, laminated, saturated, orange, no odor, gravel is fine, angular to subangular, weathered phyllite No recovery	1	N/A	0	--		5	
10	989				GRAVELLY SILT, no plasticity, very soft, homogeneous, wet, orange/gray, no odor, gravel is fine, angular to subangular, weathered phyllite	2	N/A	0*	50%		10	
15	984				PHYLLITE, very hard, laminated, dry, tan/orange/green, no odor, very brittle	3	N/A	0	100%		15	Bentonite/Grout
20	979				PHYLLITE, hard, laminated, dry, tan/orange/green, no odor, very brittle	4	N/A	0	75%		20	2" I.D. PVC Riser
25	974		GM		PHYLLITE, very hard, laminated, dry, orange/tan/green, no odor, brittle	5	N/A	0	50%		25	
30	969				PHYLLITE, no plasticity, very hard, laminated, dry, orange/tan/green, no odor, brittle	6	N/A	0*	50%		30	Bentonite Seal
35	964	▼			PHYLLITE, no plasticity, hard, laminated, moist, orange/white/green, no odor	7	N/A	0	50%		35	Flush Threaded Joint Top Screen Elev. 964.3
40	959				PHYLLITE, no plasticity, hard, laminated, moist, orange/white/green, no odor, brittle	8	N/A	0	75%		40	20/40 Well Rounded Silica Sand 2" I.D. Slotted PVC Screen
45	954				PHYLLITE, no plasticity, hard, laminated, orange/white/green, no odor (Boring terminated @ 45.2 ft BGS)	9	N/A	0	75%		45	Bottom Screen Elev. 955.0 Threaded Bottom Plug
50	949										50	
55											55	

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highwat 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-SI  
 Project Type: Secondary Investigation

### Boring Information:

Date / Time: 11-26-18 / 15:20  
 Logged By: AP  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 40.8 ft BGS  
 Initial Saturation (ft)/Date: 39.0 ft BGS (11-26-18)  
 Static GW level (ft)/Date: 31.60 ft BTOC (12-10-18)  
 Surface Elevation (ft): 998.1 ft  
 Sampling Interval: 2 ft every 5 ft

### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 11-26-18  
 Total Well Depth: 40.8 ft BTOC  
 Screened Interval: 30.8 ft - 40.2 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 5 gal

Depth in Feet	Surf. Elev. 998.1	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: MW-9
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
0	998				CONCRETE/GRAVEL						0	Manhole Cover TOC Elev. 997.60
5	993				GRAVELLY SILT, hard, homogeneous, moist, orange, no odor, gravel is fine, angular to subangular, weathered phyllite		1	N/A	0*	50%	5	
10	988		GM		GRAVELLY SILT, hard, homogeneous, moist, orange/tan, no odor, gravel is fine, angular, weathered phyllite		2	N/A	--	--	10	
15	983				No recovery		3	N/A	0	75%	15	Bentonite/Grout
20	978				GRAVELLY SILT, no plasticity, very hard, homogeneous, moist, red/tan/ no odor, gravel is fine, angular to subangular		4	N/A	0	80%	20	2" I.D. PVC Riser
25	973				SILT, no plasticity, soft, homogeneous, moist, orange/tan, no odor, weathered phyllite		5	N/A	0	80%	25	
30	968		ML		SILT, no plasticity, soft, homogeneous, moist, orange/tan, no odor, weathered phyllite		6	N/A	0*	100%	30	Bentonite Seal
35	963				PHYLLITE, no plasticity, soft, laminated, moist, tan/white/green, no odor		7	N/A	0	100%	35	Flush Threaded Joint Top Screen Elev. 966.8
40	958				PHYLLITE, no plasticity, soft, laminated, wet, tan/white/green, no odor		8	N/A	0	50%	40	20/40 Well Rounded Silica Sand 2" I.D. Slotted PVC Screen
45	953				PHYLLITE, no plasticity, soft, laminated, saturated, tan/white, no odor						45	Bottom Screen Elev. 957.5
50	948				(Boring terminated @ 40.8 ft BGS)						50	Threaded Bottom Plug
55											55	

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highwat 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-SI  
 Project Type: Secondary Investigation

### Boring Information:

Date / Time: 11-27-18 / 10:05  
 Logged By: AP  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 40.1 ft BGS  
 Initial Saturation (ft)/Date: 38.0 ft BGS (11-27-18)  
 Static GW level (ft)/Date: 26.20 ft BTOC (12-10-18)  
 Surface Elevation (ft): 996.3 ft  
 Sampling Interval: 2 ft every 5 ft

### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 11-27-18  
 Total Well Depth: 40.1 ft BTOC  
 Screened Interval: 30.1 ft - 39.4 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Sump pump  
 Gallons Purged: 25 gal

Depth in Feet	Surf. Elev. 996.3	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: MW-10
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
0	996				ASPHALT						0	Manhole Cover TOC Elev. 995.97
5	991				SILT, no plasticity, soft, homogeneous, moist, tan, no odor, cohesive, weathered phyllite		1	N/A	0*	80%	5	
10	986				SILT, no plasticity, soft, homogeneous, moist, tan, no odor, cohesive, weathered phyllite		2	N/A	0	100%	10	
15	981				SILT, no plasticity, firm, homogeneous, moist, reddish orange, no odor, weathered phyllite		3	N/A	0	100%	15	Bentonite/Grout
20	976		ML		SILT, no plasticity, firm, homogeneous, moist, red/orange, no odor		4	N/A	0	100%	20	2" I.D. PVC Riser
25	971	▼			PHYLLITE, no plasticity, firm, laminated, dry, tan/pink/white, no odor		5	N/A	0*	100%	25	Bentonite Seal
30	966				PHYLLITE, no plasticity, firm, laminated, moist, tan/orange/white, no odor		6	N/A	0	80%	30	Flush Threaded Joint Top Screen Elev. 965.9
35	961				PHYLLITE, no plasticity, hard, laminated, moist, red/tan/green, no odor, very brittle		7	N/A	0	100%	35	20/40 Well Rounded Silica Sand 2" I.D. Slotted PVC Screen
40	956	▽			SILT, no plasticity, firm, homogenous, moist, reddish orange, no odor		8	N/A	0	100%	40	Bottom Screen Elev. 956.6 Threaded Bottom Plug
45	951				SILT, no plasticity, firm, homogenous, moist, orange/tan, no odor						45	
50	946				SILT, no plasticity, very soft, homogeneous, saturated, tan/orange, no odor						50	
55					(Boring terminated @ 40.1 ft BGS)						55	

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highwat 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-SI  
 Project Type: Secondary Investigation

### Boring Information:

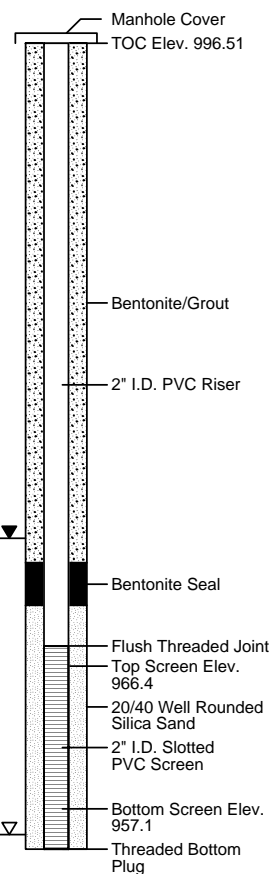
Date / Time: 11-28-18 / 8:45  
 Logged By: AP  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 40.3 ft BGS  
 Initial Saturation (ft)/Date: 39.0 ft BGS (11-28-18)  
 Static GW level (ft)/Date: 24.4 ft BTOC (12-10-18)  
 Surface Elevation (ft): 996.8 ft  
 Sampling Interval: 2 ft every 5 ft

### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 11-28-18  
 Total Well Depth: 40.1 ft BTOC  
 Screened Interval: 30.1 ft - 39.5 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 8 gal

Depth in Feet	Surf. Elev. 996.8	Water Level	USCS	GRAPHIC	Water Levels		DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
					▼ Static GW level	▽ Initial Saturation						
0	996						SILT, no plasticity, soft, homogeneous, moist, tan, no odor					0
5	991		ML				SILT, soft, homogeneous, moist, tan, no odor, weathered phyllite	1	N/A	0*	100%	5
10	986						SILT, no plasticity, soft, homogeneous, moist, tan, no odor, weathered phyllite	2	N/A	0	100%	10
15	981		GM				GRAVELLY SILT, no plasticity, very soft, homogeneous, wet, tan/brown, no odor	3	N/A	0	75%	15
20	976						SILT, no plasticity, very soft, homogeneous, moist, tan, no odor, weathered phyllite	4	N/A	0*	100%	20
25	971	▼					SILT, no plasticity, very soft, homogeneous, moist, tan/orange, no odor, weathered phyllite	5	N/A	0	100%	25
30	966		ML				PHYLITE, no plasticity, hard, laminated, moist, tan/orange/green, no odor, very brittle	6	N/A	0	100%	30
35	961						PHYLITE, no plasticity, hard, laminated, moist, tan/orange/green, no odor, very brittle	7	N/A	0	50%	35
40	956	▽					PHYLITE, no plasticity, hard, laminated, moist, tan/green, no odor, very brittle (Boring terminated @ 40.3 ft BGS)	8	N/A	0	100%	40
45	951											45
50	946											50
55												55

Well Schematic: MW-11



**NOTES:**

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center, Inc.  
 Site: Highwat 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-SI  
 Project Type: Secondary Investigation

### Boring Information:

Date / Time: 11-27-18 / 7:40  
 Logged By: AP  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: 4.25" I.D. HSA  
 Total Boring Depth: 40.8 ft BGS  
 Initial Saturation (ft)/Date: 39.0 ft BGS (11-27-18)  
 Static GW level (ft)/Date: 28.30 ft BTOC (12-10-18)  
 Surface Elevation (ft): 999.5 ft  
 Sampling Interval: 2 ft every 5 ft

### Well Information:

Well Type: Type II  
 Well Purpose: Monitoring  
 Well Construction Date: 11-27-18  
 Total Well Depth: 40.6 ft BTOC  
 Screened Interval: 30.6 ft - 40.0 ft BTOC  
 Screen Slot Size: 0.01 in  
 Development Method: Sub pump  
 Gallons Purged: 15 gal

Depth in Feet	Surf. Elev. 999.5	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: MW-12
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
0	999			ASPHALT							0	Manhole Cover TOC Elev. 999.07
5	994		GC	GRAVELLY CLAY, high plasticity, soft, homogeneous, moist, reddish brown/gray, no odor, fill material			1	N/A	0*	50%	5	
10	989		GM	GRAVELLY SILT, no plasticity, soft, homogeneous, moist, reddish tan, no odor, gravel is fine, angular to subangular			2	N/A	0	50%	10	
15	984			PHYLLITE, no plasticity, firm, laminated, moist, tan/orange/green, no odor, very brittle			3	N/A	0	80%	15	Bentonite/Grout
20	979			SILT, no plasticity, soft, homogeneous, moist, reddish tan, no odor, very cohesive, weathered phyllite			4	N/A	0	50%	20	2" I.D. PVC Riser
25	974		ML	SILT, no plasticity, soft, homogeneous, moist, reddish tan, no odor, weathered phyllite			5	N/A	0*	50%	25	
30	969			PHYLLITE, no plasticity, hard, laminated, moist, tan/orange/light gray, no odor			6	N/A	0	75%	30	Bentonite Seal
35	964			SILT, no plasticity, soft, laminated, moist, reddish tan, no odor, weathered phyllite			7	N/A	0	100%	35	Flush Threaded Joint Top Screen Elev. 968.5
40	959			SILT, no plasticity, soft, laminated, moist, reddish tan, no odor, weathered phyllite			8	N/A	0	75%	40	20/40 Well Rounded Silica Sand 2" I.D. Slotted PVC Screen Bottom Screen Elev. 959.1 Threaded Bottom Plug
45	954			PHYLLITE, no plasticity, soft, laminated, saturated, tan/green, no odor							45	
50	949										50	
55											55	

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- \* Sample submitted for laboratory analysis
- Headspace conducted using RKI Eagle calibrated to Hexane

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.



# LOG OF BORING: RW-1

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center  
 Site: Highway 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-RNA1  
 Project Type: Remediation by Natural Attenuation

### Boring Information:

Date / Time: 7-20-20 / 10:20  
 Logged By: CG  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: HSA  
 Total Boring Depth: 40.4 ft BGS  
 Initial Saturation (ft)/Date: NA  
 Static GW level (ft)/Date: 30.28 ft BTOC / 8-5-20  
 Surface Elevation (ft): 1,000.5 ft  
 Sampling Interval: NA

### Well Information:

Well Type: Type II  
 Well Purpose: Recovery  
 Well Construction Date: 7-20-20  
 Total Well Depth: 40.4 ft BTOC  
 Screened Interval: 25.5 ft - 39.9 ft  
 Screen Slot Size: 0.01 inch  
 Development Method: Submersible pump  
 Gallons Purged: 37.0 gal

Depth in Feet	Surf. Elev. 1000.5	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: RW-1
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
0	1000				No Description						0	
5	995									5		
10	990									10		
15	985									15		
20	980									20		
25	975									25		
30	970	▼								30		
35	965									35		
40	960									40		
45					(Boring terminated @ 40.4 ft BGS)						45	

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.



# LOG OF BORING: RW-2

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center  
 Site: Highway 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-RNA1  
 Project Type: Remediation by Natural Attenuation

### Boring Information:

Date / Time: 7-21-20 / 11:15  
 Logged By: CG  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: HSA  
 Total Boring Depth: 41.8 ft BGS  
 Initial Saturation (ft)/Date: NA  
 Static GW level (ft)/Date: 27.95 ft BTOC / 8-5-20  
 Surface Elevation (ft): 998.7 ft  
 Sampling Interval: NA

### Well Information:

Well Type: Type II  
 Well Purpose: Recovery  
 Well Construction Date: 7-21-20  
 Total Well Depth: 41.8 ft BTOC  
 Screened Interval: 26.9 ft - 41.3 ft  
 Screen Slot Size: 0.01 inch  
 Development Method: Submersible pump  
 Gallons Purged: 45.0 gal

Depth in Feet	Surf. Elev. 998.7	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: RW-2
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
0	998				No Description						0	
5	993										5	
10	988										10	
15	983										15	
20	978										20	
25	973										25	
30	968										30	
35	963										35	
40	958										40	
45					(Boring terminated @ 41.8 ft BGS)						45	

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.





# LOG OF BORING: RW-3

## CONSULTANTS

### Client / Site Information:

Client: Highway 46 Fuel Center  
 Site: Highway 46 Fuel Center  
 Location: Heflin, AL  
 Agency Interest No.: UST18-10-07  
 PPM Project No.: 455401-RNA1  
 Project Type: Remediation by Natural Attenuation

### Boring Information:

Date / Time: 7-21-20 / 7:40  
 Logged By: CG  
 Drilling Company / Driller: Technical Drilling  
 Drilling Method: HSA  
 Total Boring Depth: 41.0 ft BGS  
 Initial Saturation (ft)/Date: NA  
 Static GW level (ft)/Date: 27.76 ft BTOC / 8-5-20  
 Surface Elevation (ft): 998.3 ft  
 Sampling Interval: NA

### Well Information:

Well Type: Type II  
 Well Purpose: Recovery  
 Well Construction Date: 7-21-20  
 Total Well Depth: 41.0 ft BTOC  
 Screened Interval: 26.1 ft - 40.5 ft  
 Screen Slot Size: 0.01 inch  
 Development Method: Submersible pump  
 Gallons Purged: 43.0 gal

Depth in Feet	Surf. Elev. 998.3	Water Level	USCS	GRAPHIC	Water Levels		Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet	Well Schematic: RW-3
					▼ Static GW level	▽ Initial Saturation						
DESCRIPTION												
0	998				No Description						0	
5	993									5		
10	988									10		
15	983									15		
20	978									20		
25	973									25		
30	968									30		
35	963									35		
40	958									40		
45					(Boring terminated @ 41.0 ft BGS)						45	

### NOTES:

- Hand cleared to 4.0' BGS prior to drilling

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

## **APPENDIX B – REGENESIS DESIGN**



Technology-Based Solutions for the Environment

PROJECT NAME

# Highway 46 Fuel Center

6658 AL-46, Heflin, AL 36264

**PREPARED FOR**

PPM Consultants, Inc.  
Matt Ebbert  
matt.ebbert@ppmco.com

**PREPARED BY**

REGENESIS  
Tyler Harris  
tharris@regenesisc.com

Daniel Pile  
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Will Mohan  
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March 13, 2024

# Project Summary

REGENESIS appreciates the opportunity to provide PPM Consultants, Inc. our remedial design and cost estimate for the Highway 46 Fuel Center project. This proposal includes an overview of our proposed solution, the project goals, technologies proposed, application design summary table and a treatment area map.

## Proposed Solution

We propose a grid application covering a 1,000 square foot area with both [PetroFix®](#) and [ORC Advanced®](#) to remediate dissolved phase hydrocarbons around MW-3 and RW-2.

## Project Goals

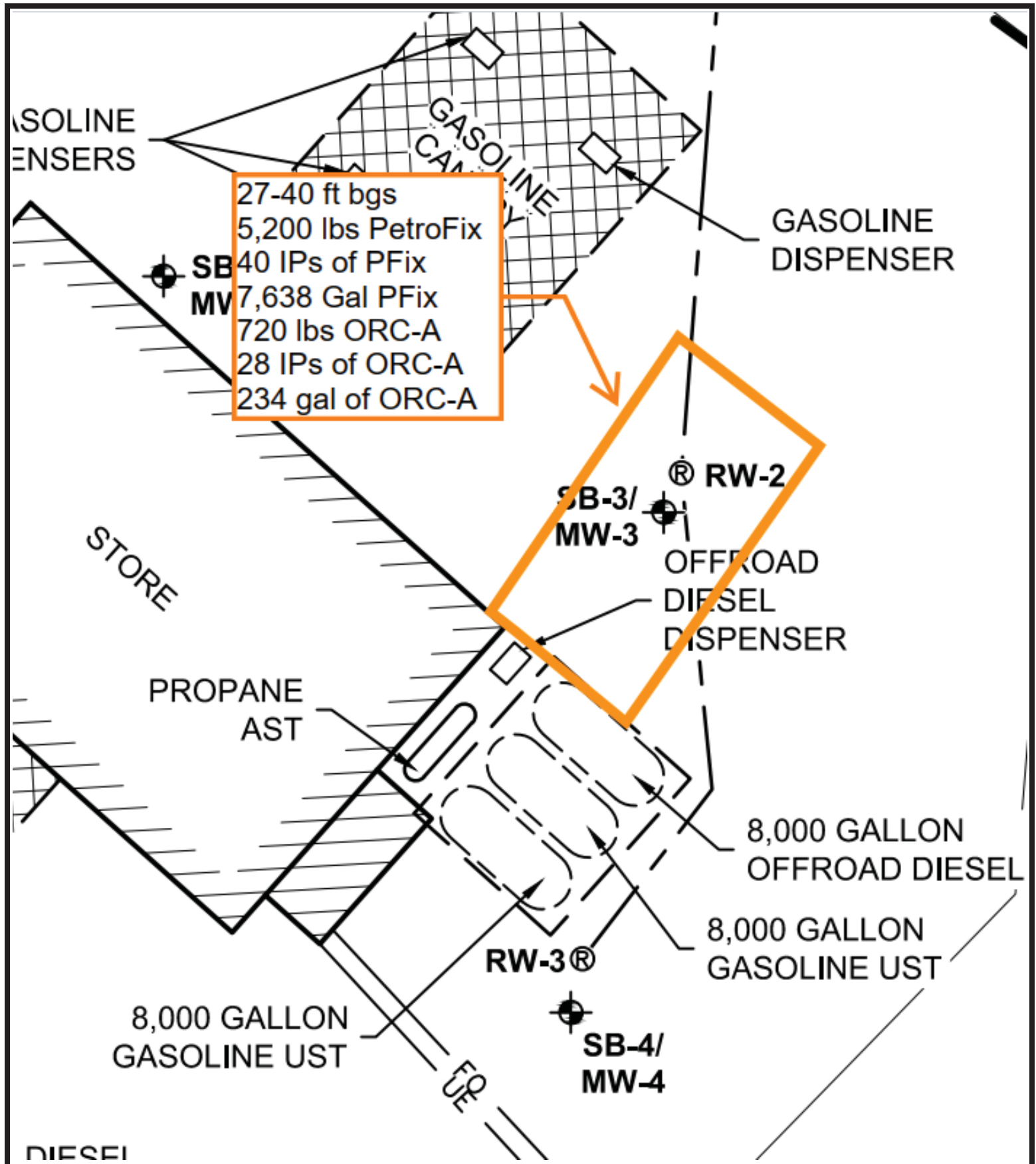
This proposal aims to reduce petroleum hydrocarbons to meet Site Specific Treatment Levels for benzene and MTBE for MW-3 and RW-2.

### Design Summary

Area Name	Grid Type	Area Square Footage	Injection Points Per Area	Vertical Injection Interval (ft bgs)	PetroFix Amount (lb)	Injection Volume Per Area (gallons)
<b><i>PetroFix Grid Estimates</i></b>						
PetroFix	Symmetric	1000 sq ft	40	27 to 40	5,200	7,638
Area Name	Grid Type	Area Square Footage	Injection Points Per Area	Vertical Injection Interval (ft bgs)	ORC Advanced Amount (pounds)	Injection Volume Per Area (gallons)
<b><i>Co-Applied ORC Advanced Grid Estimates</i></b>						
ORC-A	Symmetric	1,000	28	27 to 40	720	234

## Technical Resources

- [PetroFix® Case Study - Estimated To Save \\$1M Compared to LTM](#)
- [PetroFix® Case Study - Former Gas Station Closure and +99% Reductions - CO](#)
- [PetroFix Case Study - NFA Granted Allowing For Site Redevelopment - IN](#)
- [ORC Advanced Technical Bulletin: Compatibility with Underground Storage Structures and Pipes](#)
- [ORC Advanced Case Study: Springerville LUST Site Achieves Closure](#)
- [RRS: Performance Driven, Results Based](#)



Highway 46 Fuel Center

PPM Consultants, Inc.

March 13, 2024

Figure 1-Treatment Area Map



# Technical Approach



(Click the above product logo to access to product specification sheet for the product)

## Site Specific Recommendations

Because of a sandy layer located 29-34 ft below the ground surface, REGENESIS recommends a top-down application to best target the surrounding clays. The volume of PetroFix to be applied in each area is dependent on the localized lithology and is, therefore, not uniform. The table below shows the amount of volume that should be applied in each vertical treatment area.

Vertical Area	Volume per Foot (gal)	Total Area Volume (gal)
27-29 ft bgs	12	24
29-34 ft bgs	19	95
34-40 ft bgs	12	75

ORC-A should be applied following the application of PetroFix. The two materials should not be mixed. Applying ORC-A first or mixing the two materials can result in limited distribution and under performance.

### PetroFix Application Method

#### Recommended Application Method:

- Direct Push Top-Down

#### Primary Recommended Tooling (see the image to the right):

- Multi Internal Screen

### ORC-A Application Method

#### Recommended Application Method:

- Direct Push Bottom-Up

#### Recommended Tooling

- Expendable tip

All recommended tooling can be found at [ESP Tooling](#).

#### Radii of Influence Testing:



- Visual groundwater sample from MW-3 and RW-2

Changes to injection point spacing and injection volumes may be required based on this data.

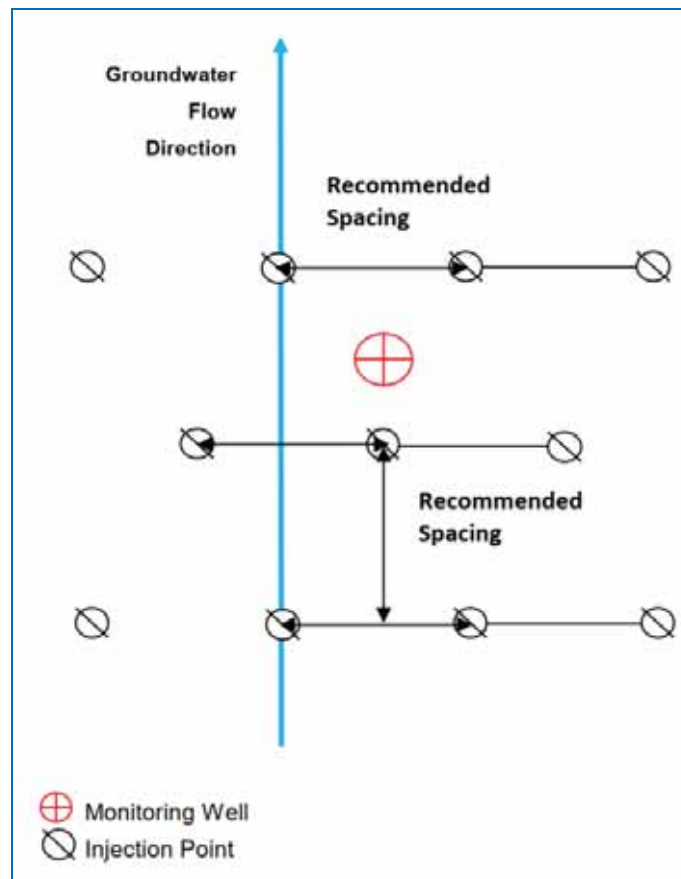
## Estimated Flowrates and Pressures

PetroFix is designed to be applied at low to moderate pressures, typically in the range of 20-80 PSI and 2-10 GPM. Higher injection pressures may sometimes be needed on some sites, but precautions should be taken to avoid fracture emplacement or surfacing when close to ground surface.

ORC-A does not require any target pressures or flowrates.

## Injection Point Spacing

PetroFix distribution is the most important aspect of the application process, and injection point spacing can be a critical step in the success of the injection and the achievement of proper PetroFix distribution. The injection point spacing provided by REGENESIS should be the distance between injection locations, not the distance from a monitoring location. In grids and barriers containing multiple rows, Regenesi recommends staggering rows like in the example layout below to limit the potential for gaps in the treatment area. In injection grids, the grid should be positioned centered upon the most contaminated monitoring well or other sampling location. This will help ensure that these contaminated areas are treated from all angles.





# Performance Objectives

## Purpose/Goals

This remedial strategy is designed to lower dissolved phase hydrocarbons in a 1,000 sq ft treatment area centered around MW-3 and RW-2 to levels at or below the SSTLs in those wells.

### SSTL CONTAMINANT CONCENTRATIONS

Well ID	SSTL Benzene (mg/L)	2023 High Benzene (mg/L)	SSTL MTBE (mg/L)	2023 High MTBE (mg/L)
MW-3	0.4658	3.14	1.863	2.44
RW-2	0.4658	2.34	2.46	1.863

## Monitoring Parameters

To measure performance at your site, we recommend the following analytical parameters be collected at all monitoring locations constructed in or within 10 ft of the planned treatment areas. The recommended [PetroFix Monitoring Parameters](#) (see next page) should be recorded for at least one sampling event before the application of PetroFix to establish a baseline as well as sampling events following the application of PetroFix. The recommended parameters are all that are needed for most sites. If you seek to identify microbial response post application, we recommend including methane, CO<sub>2</sub>, and QuantArray-Petroleum on the optional list at locations where PetroFix has been confirmed to have been distributed. Please contact REGENESIS for questions.

Analytical Parameter	Method
<b>Recommended</b>	
Contaminants of Concern (COC's)	Varies by site. Recommend a minimum of BTEX analysis plus Total Petroleum Hydrocarbon (TPH) measurements for gasoline (TPH-G) and/or diesel range contamination (TPH-D) based on contaminant source.
pH	Meter reading taken in flow-through cell (DO can also be measured with a Hach kit)
Dissolved Oxygen (DO)	
Oxidation Reduction Potential (ORP)	
Electral Conductivity (EC)	
Cations - Ca, Mn, Al*	EPA Method 6010
Sulfate	EPA 375.3 or EPA 9056
Nitrate	EPA 353.1 or EPA 9056
Visual Confirmation of PetroFix in Wells**	Place groundwater sample in 40 mL VOA for inspection. PetroFix shipments come with a field concentration test kit taped to the top of a drum or a tote. See the groundwater sampling guidance document via the hyperlink at the bottom of the page for more information.
<b>Optional</b>	
Total Fe	Colorimetric Hach Method or EPA 6000 series with filtered and unfiltered samples
Total Mn	
Dissolved Fe	
Dissolved Mn	
Sulfide	EPA 376.1
Chemical Oxygen Demand (COD)	EPA 410.1-.2
Biological Oxygen Demand (BOD)	EPA 5210B
Methane and CO <sub>2</sub>	ASTM D1945
Evaluation of biodegradation response through measurement of functional genes	<b>QuantArray Petroleum</b>
<p>Regenesis recommends that baseline samples of all monitoring parameters be taken before injection. Please check any state-specific underground injection control (UIC) guidelines for parameters that may also need to be collected, but are not included in this table.</p> <p>*Cations listed are recommended for applications involving dedicated well injection or borehole injection.</p> <p>**As is normal in any injection PetroFix may flow into adjacent wells during application. Observation in wells is helpful in knowing that you are achieving product distribution. As an option, PetroFix can be flushed from wells post injection with a clearwater flush. PetroFix normally takes a few weeks/months to attach to soils and clarify from groundwater and sampling precautions should be taken if sampling is needed during the attachment phase. <b>Helpful technical bulletins on post-application groundwater sampling, well flushing, and other information are provided online per the resource section link below.</b></p>	

## Qualifiers (Design Considerations)

- This remedial design assumes that reductions in dissolved phase COCs recorded at the end of 2023 were the result of drought conditions and not representative of current on-site conditions. For this reason, the highest recorded COC concentrations during the calendar year of 2023 were used to determine the dosing of remedial agents.
- This design issues that no direct push applications can be performed under the nearby canopy.

# Technology Overview

PetroFix is a unique activated carbon remedial fluid (carbon milled to a diameter of 1 to 2 micrometers) paired with soluble, anaerobic electron acceptors designed to remediate dissolved hydrocarbons. This allows the product to be injected as a fluid using low pressure. PetroFix is commonly used for source and plume treatment, excavation polishing, and barrier applications. PetroFix features:

- Provides rapid and sustained results allowing for faster and more certain site closure
- Dual-technology approach relies on both carbon sorption and anaerobic biodegradation
- Low-pressure "flooding" vs high pressure "fracturing" improves distribution and reduces surfacing
- Safe to handle
- Mitigates hydrocarbon back diffusion which is a cause of concentration rebound

PetroFix is typically self-applied and is supported by a large library of [application instruction, technical bulletin, and videos](#). Based on our experience at hundreds of sites we have developed recommendations listed in a hyperlinked planning document included in the following sections. Below are links for additional technologies information:

[PetroFix - An Animated Overview](#)

[PetroFix - All Webinars](#)

[PetroFix SDS](#)

Petroleum hydrocarbon plumes are typically depleted in oxygen, which limits the ability of naturally occurring microorganisms to degrade petroleum hydrocarbons. ORC Advanced supplies a controlled release of oxygen for 9-12 months in the target treatment zone to create and support the geochemical environment necessary for the aerobic biodegradation of contaminants. This preliminary technical design and cost estimate contains information related to the design, application, and performance monitoring of ORC Advanced. Use the above hyperlink to access more information about ORC Advanced.

ORC Advanced is shipped as a dry, off-white powder mixed with water to form a slurry. Most designs specify a slurry percentage of 20% to 30%. This material is typically applied using a direct push technology (DPT) injection method as proposed here. It is important that the materials be applied per the design, including material loading rates and injection point spacing specified, to the extent site conditions allow. A brief description of the application method is provided below, along with links to application instructions for these products. Regenesiis can assist with further site-specific application design information, as needed, upon notification that our proposed remedy is chosen for implementation.

## Storage

While PetroFix has a multiple month shelf-life while stored in proper conditions, it is recommended to deliver PetroFix as soon to the planned application as possible.

How to store for immediate use:

- Out of direct or prolonged sunlight
- Prevent freezing conditions
- Do not store in temperatures exceeding 90 degrees for greater than three weeks



Additional information on long term storage can be found in the [PetroFix Technical Memo: Freezing and Hot Weather Handling](#) document. Proper prolonged storage conditions include:

- Shade - no direct sunlight
- In original CLOSED containers
- Between 40 - 90°F
- Well ventilated

ORC-A is shipped in vinyl bags. These bags are water resistant, but should not be considered waterproof. Direct and significant contact with water such as rain event should be avoided.

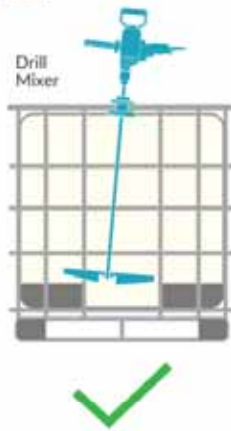
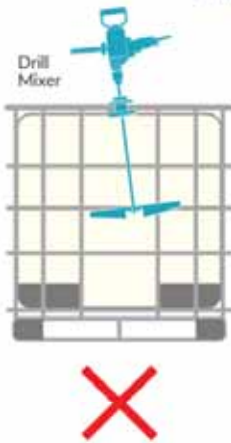
## Mixing & Transferring

Below is an abbreviated overview of product mixing recommendations for injection.

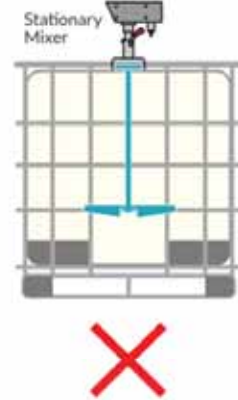
1. Homogenization – All PetroFix is checked for quality control specifications prior to shipment. The typical material viscosity is similar to motor oil (sometimes thicker) in the shipping containers. The shipped PetroFix should be homogenized prior to dilution to ensure consistency. In some cases, PetroFix may exhibit some settling or some lump formation, both of which can easily be mixed back into the product upon homogenization. REGENESIS recommends a mixer capable of being freely moved to all parts and corners of the tote or drum and capable of reaching within 3 inches of the bottom of the tote or drum to ensure complete homogenization (see illustration on next page). Dedicated tote mixers are not recommended.
2. Transferring PetroFix to mix tank - Prior to transferring PetroFix to the mix tank the specified amount of dilution water should be added to the mix tank. The recommended amount of water can be found on the design summary page. Next, the injection contractor should determine their preferred way of measuring the amount of PetroFix to be transferred to the mix tanks. Examples included physical volume transfers (i.e., graduated buckets), use of volumetric flow meters couple to pumps, internal staging sticks, or external staging marks. Specific pump recommendations that can be used for machine transfer will be discussed later under equipment recommendations.
3. Adding electron acceptor to mix tank - The electron acceptor must be added AFTER the PetroFix remedial fluid is added to the dilution tank with water. We recommend the use of a field scale to measure recommended amounts of electron acceptor needed per batch.

## Homogenizing PetroFix In Totes and Drums

All mixers should access the bottom of the mixing vessel or PetroFix concentrate containers. Minimum rod length: 48 inches.

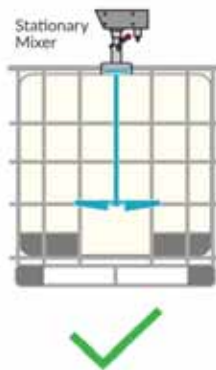
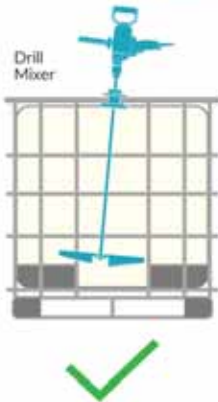


Stationary mixers inadequately access corners of the PetroFix concentrate containers.



## Mixing Diluted PetroFix in Mix Tanks

Stationary mixers and handheld paddle mixers are recommended for PetroFix solution mixing.



Recirculation inadequately mixes the PetroFix solution.



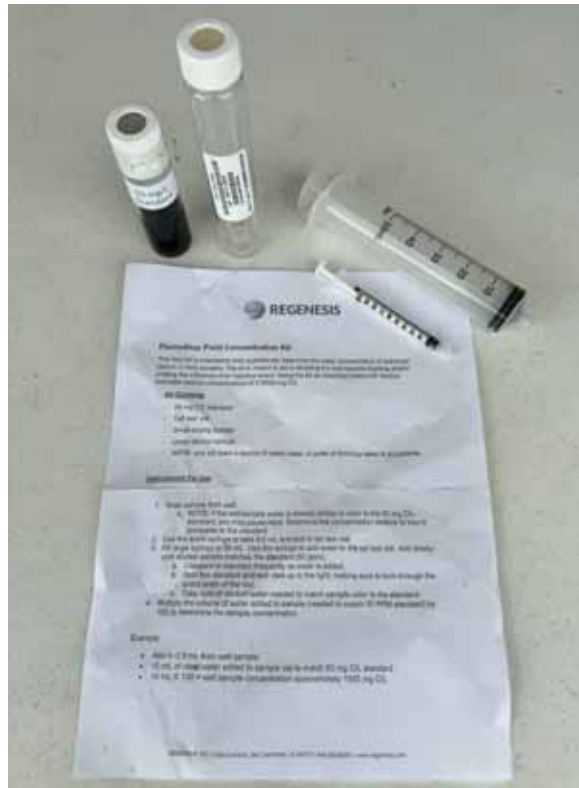
## Groundwater Sampling Guidance

### PetroFix Test Kit

For the convenience of our customers, each shipment of PetroFix includes a field concentration test kit. This kit is used to measure PetroFix concentrations in groundwater and is typically used for injection distribution testing or to determine if groundwater is within safe sampling ranges post-application.

A single test kit should arrive taped to the tops or sides of a PetroFix tote or drum, or possibly with the electron acceptor buckets. Please ensure that injection crews transfer the kits to responsible site managers to avoid loss. If a test kit cannot be found, please inform REGENESIS, and a replacement kit will be shipped out. These test kits are reusable if stored under similar conditions as recommended for PetroFix.

A single test kit should arrive taped to the tops or sides of a PetroFix tote or drum, or possibly with the electron acceptor buckets. Please ensure that injection crews transfer the kits to responsible site managers to avoid loss. If a test kit cannot be found, please inform REGENESIS, and a replacement kit will be shipped out. These test kits are reusable if stored under similar conditions as recommended for PetroFix.



You can begin monitoring after the water clarifies to background conditions or drops below 100 ppm of residual suspended PetroFix. In most cases, suspended concentrations of PetroFix fall below this level within three months. However, site-specific conditions or application events may extend this timeframe. A comprehensive summary of groundwater sampling procedures and techniques to obtain clarified samples is described in the [Colloidal Activated Carbon \(CAC\) Sampling Guidance Document](#).

If you need to sample within three months post-application, please contact REGENESIS to discuss possible design modifications or options presented in the sampling guidance document.



# Statement of Qualifications

REGENESIS Remediation Services (RRS) provides turn-key remediation planning, design, and application services. RRS field scientists are college degreed professionals that understand the details of each remediation design, the site conceptual site model, the remediation chemistry being applied, the significance of the designed reagent dosing and achieving subsurface distribution, and how a breakdown of any one of these and other factors can result in poor remediation performance. They have the unique background and experience to understand the significance of modifications made in the field.

RRS' direct management of the injection program optimizes the design and ultimately, the overall remedy performance. No one has more professional experience handling and applying in situ remediation products than RRS personnel.

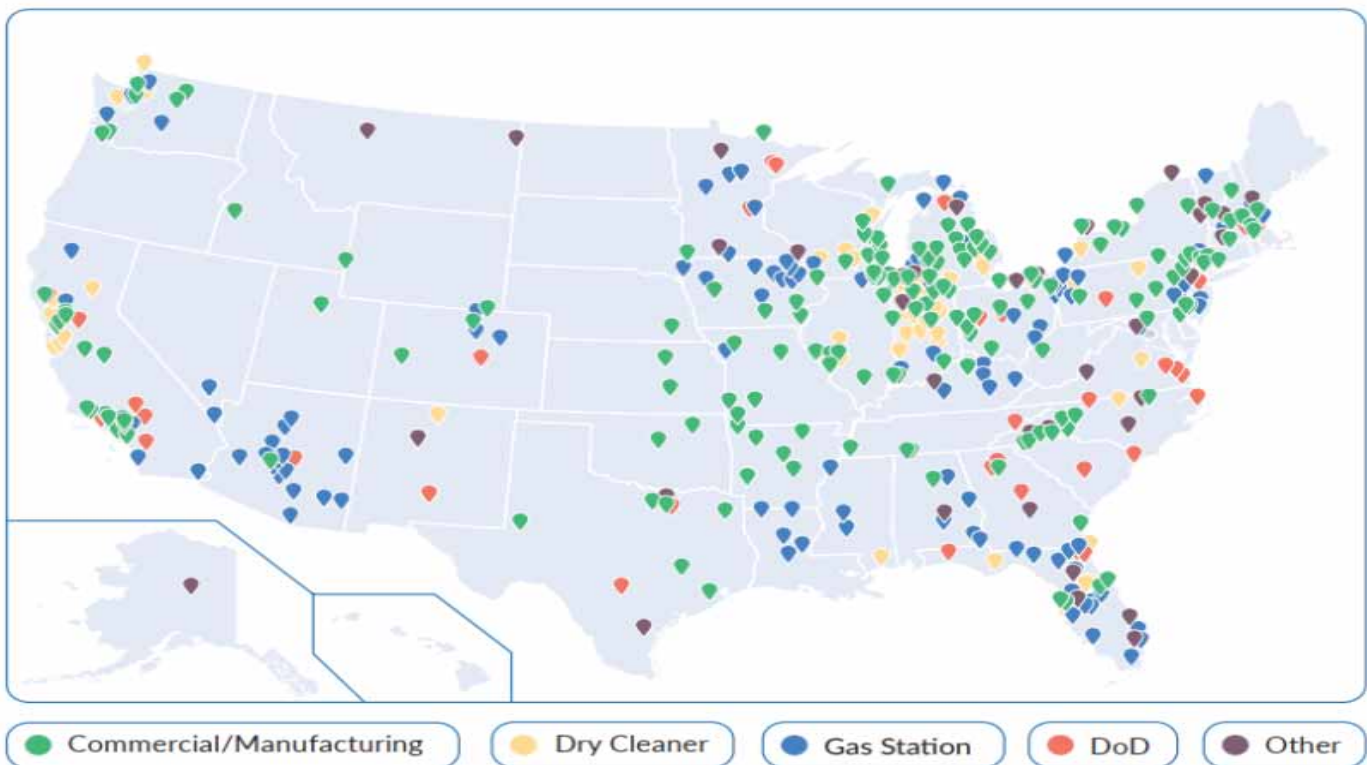
RRS has been offering industry-leading application services combined with excellence in field activity management for over a decade. We achieve success by meeting the cleanup objectives established by the environmental engineering firms who contract our services. To produce this outcome, we field experienced, disciplined, and dedicated project teams who work with our clients to address the unique requirements of each project site. Astute technical insight and timely, direct, and honest communication are hallmarks of RRS. Our reputation for meeting or exceeding clients' objectives has been proven in project successes throughout North America.

**Further information on what sets RRS apart is provided in the following technical resources:**

- [RRS: Performance Driven, Results Based](#)
- [The RRS Difference](#)
- [RRS Project Experience](#)

With decades of application experience, RRS is strategically located across the country to mobilize and assist on a wide range of sites throughout the US.

Over 100 Projects Completed Annually Across the US





# RRS Scope of Services

RRS will work under the direction of PPM Consultants, Inc. to implement the remedy in the field, applying the selected remediation technologies. RRS and PPM Consultants, Inc. will share the responsibilities for implementing this scope of work. The delegation of responsibilities is outlined in this section and under the Assumptions/Qualification section. At the beginning of each day, RRS will conduct a safety tailgate meeting and review the day’s goals, procedures, and responsibilities.

RRS will be equipped with multiple injection tool options to use with 1.5-inch diameter DPT rods. The injection tool string will be advanced to the top or bottom of the target treatment zone and injections will be performed in a bottom-up or top-down method depending on the site lithology.

The remediation technologies will be mixed in an injection trailer (Figure 2) with water in batches at the designated solution percentage and kept in constant suspension throughout the injection application. Pressures, flow rates, and total volume will be monitored and digitally documented for each injection interval. Simultaneous injection at multiple locations may be conducted to increase efficiencies on-site. RRS will monitor the injection points and surrounding areas for any signs of surfacing, and a spill response kit will be on standby.

During the application, real-time information will be collected and analyzed to help verify design assumptions and subsurface reagent distribution. Depending on the primary product applied, data collected and analyzed may consist of groundwater quality parameters (i.e., pH, conductivity, DO, ORP, etc.), depth-to-water measurements, visual indicators through groundwater or soil samples, and in-field injection concentration test kits. This information is typically collected during the application when operating within 10 feet of an appropriately screened monitoring well. Based on the information collected, the project team may modify the remediation design to optimize the injection application further. Typical modifications may include injection concentrations, volume per vertical foot, injection intervals, and point spacing.

Once the injection event is completed, RRS will demobilize all equipment and personnel off-site. A detailed injection summary report which includes injection point data (interval depths, injection pressure/flow rates, reagent volume, time elapsed and if surfacing occurred), field observations and any other noteworthy information, will be prepared and submitted to PPM Consultants, Inc..

## Scope of Services Summary

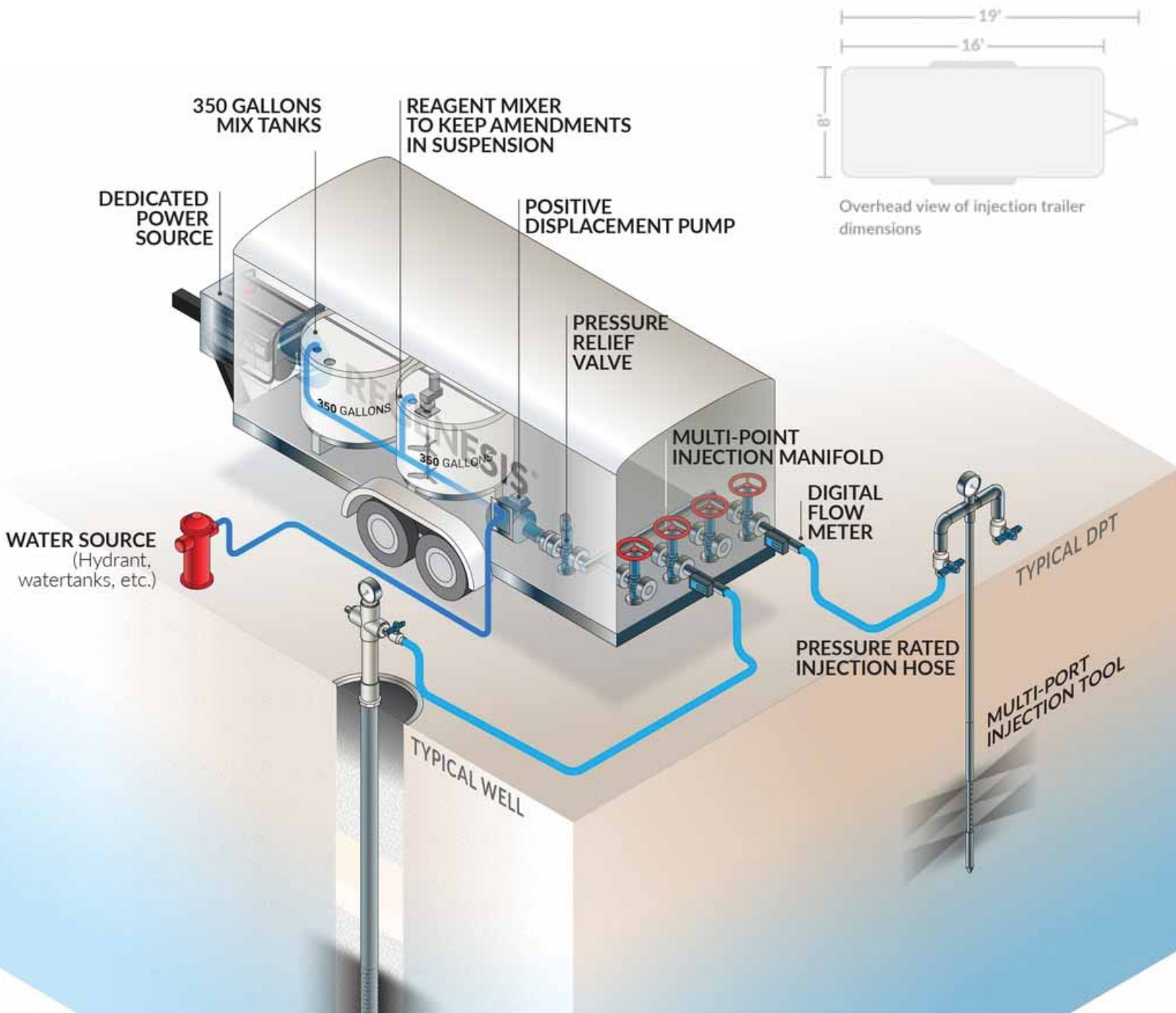
<b>Application Type</b>	<b>Direct-Push Injection</b>
<b>Volume</b>	<b>7,872 gallons</b>
<b># of Injection Points</b>	<b>40 PetroFix Injection Points</b> <b>28 ORC-A Injeciton Points</b>
<b>RRS Days On-Site</b>	<b>8</b>
<b>Direct-Push Services Provided by</b>	<b>RRS</b>

# Custom-Built Application Equipment

RRS maintains a dedicated fleet of ready-to-deploy application systems strategically located throughout the US that provide comprehensive injection services, reliability, and accountability.

RRS has numerous purpose-built reagent application systems and can modify systems and appurtenances to accommodate any scenario.

Figure 2: RRS Application Trailer



# Project Responsibilities

## RRS will:

- Provide and ship the specified quantities of the remediation reagents to the site address provided by PPM Consultants, Inc.. RRS shipping estimates assume all products will be shipped to the site simultaneously.
- Coordinate with PPM Consultants, Inc. prior to any shipment of product. Alternative shipping locations or phases could lead to an increase in freight costs.
- Mobilize a 40-hour HAZWOPER certified crew experienced in correctly applying REGENESIS remediation technologies.
- Contract a qualified, licensed DPT drilling operator equipped with the necessary tooling and materials to safely complete the application scope of work outlined within this proposal. Equipment to be mobilized includes:
  - Track-mounted DPT rig capable of reaching the target depth
  - Two-person crew
  - Enough rods to drill up to 5 locations simultaneously
  - Teflon tape for all rod joints
  - Granular bentonite, and bentonite chips.

## PPM Consultants, Inc. will:

- Coordinate project schedule and reagent order with RRS to ensure adequate shipping and mobilization time.
- Coordinate site access with the property owner to coincide with the project schedule and identify a secure product staging area.
- Provide a forklift for the project's duration to maneuver the product containers.
- Take delivery of the remediation chemistry prior to RRS mobilization and stage inside a secure storage location where the material will not be affected by inclement weather. During injection activities, PPM Consultants, Inc. will ensure the product is stored in a location accessible by the forklift.
- Should private underground utilities be within the treatment area, PPM Consultants, Inc. will contract with a private utility locating service to mark utilities prior to RRS mobilization.
- Provide a water source (e.g. hydrant) capable of producing at least 30 GPM for the project duration within 300 ft. of the project staging area, at no cost to RRS.
- Be responsible for disposal or recycling of totes, drums, pails and pallets. All nonhazardous refuse will be collected and placed in a PPM Consultants, Inc.-provided on-site refuse container for disposal. RRS will collect project related refuse and empty treatment chemistry containers daily to keep the site clean.
- Be responsible for transportation and disposal of any contaminated waste generated on-site during injection activities, though we do not anticipate generating any such waste.
- PPM Consultants, Inc. will provide field water quality meter similar to a YSI 556 with a down-hole sensor, a water level meter, bailers and a technician while on-site for injection activities to assist RRS in assessing groundwater from monitoring wells.

# Services Assumptions and Qualifications

In generating this proposal, RRS relied upon professional judgment and site-specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to estimate product quantities and subsurface placement required to achieve the remedial goals. The attached design summary tables specify the assumptions used to complete the remedial design. We request that these modeling input assumptions be verified by your firm before injection. Other assumptions and qualifications related to this proposal are as follows:

- The product and services cost outlined will be valid for 60 days the proposal date. If beyond 60 days, RRS reserves the right to update the cost.
- The freight charges included for product delivery above are estimated at the time of proposal generation. Actual freight charges are neither set nor guaranteed by RRS and are calculated when the product order is placed. This price may vary from what is estimated above. Actual freight charges for product delivery will be invoiced.
- Freight delivery time frames cannot be guaranteed and RRS will not be responsible for any delays or increased costs associated with those delays.
- If applicable, sales tax charges for product, freight, and services are considered estimated at the time of proposal submittal. The appropriate sales tax category (i.e., product, freight, and services) and actual sales tax rate are finalized at the time of invoice and may change from date of proposal submittal.
- RRS will have access to the site for equipment operation and secure storage of materials and equipment throughout the project duration. Access to each work area location will be clear and free of obstructions. RRS also assumes the injection trailer can be staged within 80 feet of the furthest injection point location.
- PPM Consultants, Inc. is responsible for securing any permits prior to mobilizing to the site.
- PPM Consultants, Inc. is responsible for all soil, air, and groundwater sampling and analysis.
- For safety reasons, access to the treatment area will be limited to RRS and PPM Consultants, Inc. personnel.
- The remediation design and injection procedures contain the necessary precautions to minimize the likelihood of surfacing of the treatment chemistry. RRS will monitor the injection flow rates and pressures and observe for signs of reagent surfacing around active injection areas. If surfacing is detected, RRS will stop or slow down injection activities at that location to stop additional surfacing and remove/vacuum up recoverable surfaced fluid. RRS is not responsible for treatment chemistry infiltration into undesired locations beyond our visible control.
- RRS personnel will have access to the site for work up to 12 hours per day Monday through Friday (daylight hours). However, the standard workday does not exceed 10 hours with travel time Monday through Friday. A 10-hour workday does not mean 10 hours on-site and/or injection pumping. Additional charges may apply for work completed on Saturday and Sunday.
- RRS is not responsible for damage to unmarked utilities and subsurface structures. PPM Consultants, Inc. will review as-built drawings with RRS to confirm clearance prior to advancing DPT injection tooling and marking injection point locations.
- Pricing and work schedule assume union labor and prevailing wages (Davis-Bacon) are not required.



- This proposal assumes probing and drilling will begin at the ground surface. If hand auger, concrete/asphalt coring, or air knife services are required, additional charges, including for surface restoration could apply.
- RRS assumes that direct-push style drill rig can access all injection point locations and drive 1.5" diameter injection tooling to the required depth. If site conditions limit the use of the provided direct-push rig or tooling for any injection point and other drilling methods are required to complete the task, additional charges will apply.
- All traffic control requirements, if necessary, will be provided by PPM Consultants, Inc..
- RRS will close/backfill all injection points to ground surface with bentonite. Ground surface restoration costs have not been included. Additional charges will apply if surface restoration is needed.
- Site conditions can change over time and should be monitored post injection. RRS is not responsible for changing site conditions after completing the scope of work and demobilizing. Such changes include but are not limited to changes related to borehole abandonment (i.e., swelling of backfill material), surface restoration, well conditions, and on-site utilities.



# Health and Safety Plan

RRS is committed to providing a safe and healthy working environment for all on-site employees, including PPM Consultants, Inc.s and contractors on-site. Before mobilization, RRS will develop a site-specific Health and Safety Plan (HASP) and designate an on-site safety officer. All personnel on-site are required to participate in daily safety tailgate meetings to proactively identify potential hazards and mitigate risks to the full extent possible.

In addition to the hours of rigorous safety training courses all personnel are required to complete, RRS also incorporates a behavior-based safety program by utilizing our DoneSafe mobile application (app) interface on every site. This app encourages our personnel to actively search for potential on-site risks and document mitigation actions. The effectiveness of our safety program can be seen in our industry-leading Experience Modification Rating (EMR) listed in table below.

Year	Total Hours	EMR
2023	193,433	0.64
2022	189,458	0.73
2021	125,592	0.71
2020	162,037	0.64

RRS safety tailgate meetings and HASP will include the following:

- Site map .
- List of personnel and contact information for employees on-site and supporting the project.
- Route to the nearest occupational treatment facility and hospital along with contact information.
- Job Hazard Analysis (JHA) detailing each job task on-site with its potential hazards and best practices to avoid those hazards.
- Description and hazards of the contaminants of concern (COC) with appropriate Personal Protection Equipment (PPE) requirements.
- List and description of REGENESIS chemicals on-site including a Safety Data Sheet (SDS) for each chemical.
- Checklist of site safety equipment including fire extinguishers, eyewash station, first aid kit, spill prevention kit and any site-specific equipment needed.
- Daily tailgate safety meeting sheet with identified hazards and risks associated with the site and job tasks for that day, along with shared learning observations from the previous day.



# Pricing

Below is the cost estimate for to provide the remediation technologies and execute the application design provided in this proposal. Please also see the assumptions and qualifications section.

Description	Subtotal
<b>Remediation Products</b> 5,200 lbs. of PetroFix, 260 lbs. of EA Blend, 720 lbs. of ORC-A, includes freight and tax	\$41,056.63
<b>Remediation Services</b> Includes injection trailer, DPT rig and crew for 8 days	\$76,202
<b>Total</b>	<b>\$117,258.63</b>

The cost provided above is inclusive of all product, estimated product freight, product mixing, injection services as outlined within this proposal, tax and materials to complete the work. We will submit invoice(s) when product ships and upon project completion or end of calendar month for remediation services. **Payment terms are Net 30 days upon invoice submittal. Should payment terms be extended beyond 30 days, finance charges may be applied.**

Please note that this pricing is contingent upon completion of this scope of work without delays or work stoppages once mobilization occurs. RRS has allotted eight (8) on-site working days (10-hr days, Monday through Friday) to apply the remediation technologies. RRS believes the scope of work provided above can be completed in this timeframe proposed, however, if the project is delayed due to circumstances beyond our control, RRS will utilize a daily rate of \$7,500 plus applicable tax to the invoice price. Should the project be completed ahead of schedule, a portion of the daily rate may be credited to the final invoice after review. RRS reserves the right to modify the design and associated cost if additional information gathered warrants modification.

**COST ESTIMATE DISCLAIMER:** The cost listed assumes conditions set forth within the proposed scope of work and assumptions and qualifications. Changes to either could impact the final cost of the project. This may include final shipping arrangements, sales tax or application related tasks such as product storage and handling, access to water, etc. If items listed need to be modified, please contact RRS for further evaluation.

**REGENESIS** developed this Scope of Work in reliance upon the data and professional judgements provided by those whom completed the earlier environmental site assessment(s), and in reliance upon REGENESIS' prior experience on similar project sites. The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limit on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the government.



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**PROFESSIONAL JUDGEMENT:** In generating this estimate, REGENESIS relied upon professional judgement and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.





# Acknowledgement

Signature below confirms signee has reviewed the proposal and agrees with all outlined responsibilities and assumptions/qualifications. Please also review our [terms and conditions](#).

Here is a list of next steps toward implementation of this project. Please note these steps may take 4-6 weeks to complete depending upon the complexity of the project and previous experience with your company. RRS will contact you soon to begin the implementation process.

## Steps to Project Implementation

1. Sign acceptance of proposal
2. Finalize contract documents incorporating this proposal or formal REGENESIS Subcontract Agreement
3. Confirm account credit status
4. Complete remediation services logistics evaluation
5. Confirm delivery address and date
6. Schedule application

Please sign below to acknowledge acceptance of proposal Highway 46 Fuel Center PetroFix and ORC Proposal for the Highway 46 Fuel Center Site and authorize REGENESIS to proceed with a final contract and work authorization:



SIGNATURE  
Matt Ebbert

Not yet accepted

PPM Consultants, Inc. | Matt Ebbert, Senior Geologist

# Terms & Conditions

1. **PAYMENT TERMS.** Net 30 Days. Accounts outstanding after 30 days will be assessed 1.5% monthly interest. Volume discount pricing will be rescinded on all accounts outstanding over 90 days. An early payment discount of 1.5% Net 10 is available for cash or check payments only. We accept Master Card, Visa and American Express.
2. **RETURN POLICY.** A 15% re-stocking fee will be charged for all returned goods. All requests to return product must be pre-approved by seller. Returned product must be in original condition and no product will be accepted for return after a period of 90 days.
3. **FORCE MAJEURE.** Seller shall not be liable for delays in delivery or services or failure to manufacture or deliver due to causes beyond its reasonable control, including but not limited to acts of God, acts of buyer, acts of military or civil authorities, fires, strikes, flood, epidemic, war, riot, delays in transportation or car shortages, or inability to obtain necessary labor, materials, components or services through seller's usual and regular sources at usual and regular prices. In any such event Seller may, without notice to buyer, at any time and from time to time, postpone the delivery or service dates under this contract or make partial delivery or performance or cancel all or any portion of this and any other contract with buyer without further liability to buyer. Cancellation of any part of this order shall not affect Seller's right to payment for any product delivered or service performed hereunder.
4. **LIMITED WARRANTY.** Seller warrants the product(s) sold and services provided as specified on face of invoice, solely to buyer. Seller makes no other warranty of any kind respecting the product and services, and expressly DISCLAIMS ALL OTHER WARRANTIES OF WHATEVER KIND RESPECTING THE PRODUCT AND SERVICES, INCLUDING ALL WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE AND NON-INFRINGEMENT.
5. **DISCLAIMER.** Where warranties to a person other than buyer may not be disclaimed under law, seller extends to such a person the same warranty seller makes to buyer as set forth herein, subject to all disclaimers, exclusions and limitations of warranties, all limitations of liability and all other provisions set forth in the Terms and Conditions herein. Buyer agrees to transmit a copy of the Terms and Conditions set forth herein to any and all persons to whom buyer sells, or otherwise furnishes the products and/or services provided buyer by seller and buyer agrees to indemnify seller for any liability, loss, costs and attorneys' fees which seller may incur by reason, in whole or in part, of failure by buyer to transmit the Terms and Conditions as provided herein.
6. **LIMITATION OF SELLER'S LIABILITY AND LIMITATION OF BUYER'S REMEDY.** Seller's liability on any claim of any kind, including negligence, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair or use of any goods or performance of any services covered by or furnished hereunder, shall in no case exceed the lesser of (1) the cost of repairing or replacing goods and repeating the services failing to conform to the foregoing warranty or the price of the goods and/or services or part thereof which gives rise to the claim. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, OR FOR DAMAGES IN THE NATURE OF PENALTIES.
7. **INDEMNIFICATION.** Buyer agrees to defend and indemnify seller of and from any and all claims or liabilities asserted against seller in connection with the manufacture, sale, delivery, resale or repair or use of any goods, and performance of any services, covered by or furnished hereunder arising in whole or in part out of or by reason of the failure of buyer, its agents, servants, employees or customers to follow instructions, warnings or recommendations furnished by seller in connection with such goods and services, by reason of the failure of buyer, its agents, servants, employees or customers to comply with all federal, state and local laws applicable to such goods and services, or the use thereof, including the Occupational Safety and Health Act of 1970, or by reason of the negligence or misconduct of buyer, its agents, servants, employees or customers.

8. **EXPENSES OF ENFORCEMENT.** In the event seller undertakes any action to collect amounts due from buyer, or otherwise enforce its rights hereunder, Buyer agrees to pay and reimburse Seller for all such expenses, including, without limitation, all attorneys and collection fees.
9. **TAXES.** Liability for all taxes and import or export duties, imposed by any city, state, federal or other governmental authority, shall be assumed and paid by buyer. Buyer further agrees to defend and indemnify seller against any and all liabilities for such taxes or duties and legal fees or costs incurred by seller in connection therewith.
10. **ASSISTANCE AND ADVICE.** Upon request, seller in its discretion will furnish as an accommodation to buyer such technical advice or assistance as is available in reference to the goods and services. Seller assumes no obligation or liability for the advice or assistance given or results obtained, all such advice or assistance being given and accepted at buyer's risk.
11. **SITE SAFETY.** Buyer shall provide a safe working environment at the site of services and shall comply with all applicable provisions of federal, state, provincial and municipal safety laws, building codes, and safety regulations to prevent accidents or injuries to persons on, about or adjacent to the site.
12. **INDEPENDENT CONTRACTOR.** Seller and Buyer are independent contractors and nothing shall be construed to place them in the relationship of partners, principal and agent, employer/employee or joint ventures. Neither party will have the power or right to bind or obligate the other party except as may be expressly agreed and delegated by other party, nor will it hold itself out as having such authority.
13. **REIMBURSEMENT.** Seller shall provide the products and services in reliance upon the data and professional judgments provided by or on behalf of buyer. The fees and charges associated with the products and services thus may not conform to billing guidelines, constraints or other limits on fees. Seller does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where seller may serve as a supplier or subcontractor to an entity that seeks reimbursement from the Government for all or part of the services performed or products provided by seller, it is the sole responsibility of the buyer or other entity seeking reimbursement to ensure the products and services and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity that seeks reimbursement from the Government, seller does not knowingly present or cause to be presented any claim for payment to the Government.
14. **APPLICABLE LAW/JURISDICTION AND VENUE.** The rights and duties of the parties shall be governed by, construed, and enforced in accordance with the laws of the State of California (excluding its conflict of laws rules which would refer to and apply the substantive laws of another jurisdiction). Any suit or proceeding hereunder shall be brought exclusively in state or federal courts located in Orange County, California. Each party consents to the personal jurisdiction of said state and federal courts and waives any objection that such courts are an inconvenient forum.
15. **ENTIRE AGREEMENT.** This agreement constitutes the entire contract between buyer and seller relating to the goods or services identified herein. No modifications hereof shall be binding upon the seller unless in writing and signed by seller's duly authorized representative, and no modification shall be effected by seller's acknowledgment or acceptance of buyer's purchase order forms containing different provisions. Trade usage shall neither be applicable nor relevant to this agreement, nor be used in any manner whatsoever to explain, qualify or supplement any of the provisions hereof. No waiver by either party of default shall be deemed a waiver of any subsequent default.



# Detailed Design Table



## PetroFix Application Summary Grid Estimate Highway 46 Fuel Center PetroFix



<b>PetroFix Amount</b>	<b>5,200 lb</b>
Electron Acceptor Amount	260 lb
Treatment Surface Area	1,000 ft <sup>2</sup>
Injection Points	40
Point Spacing	5.0 ft
Top of Treatment Interval	27.0 ft bgs
Bottom of Treatment Interval	40.0 ft bgs
Treatment Volume	481 yd <sup>3</sup>
PetroFix Dose	10.8 lb/yd <sup>3</sup>

<b>Total Volume</b>	<b>7,638 gal</b>
Product Volume	532 gal
Water Volume	7,105 gal
Injection Volume Per Point	191 gal
Injection Volume Per Vertical Foot	VARIES gal
Product/Point	13.3 gal
Water/Point	177.6 gal
Soil Type	Fine >75% Silt/Clay
Effective Pore Volume Fill %	52%

<b>Mix Tank Volume*</b>	<b>275 gal</b>
Dilution Factor	14.4 x
PetroFix per Mix Tank	19.2 gal
Water Per Mix Tank	255.8 gal
Electron Acceptor per Mix Tank	9.3 lb
Number of Batches Required	27.8

\*Adjust tank volume to that used in field.

<b>Reported Groundwater Concentrations (mg/L)</b>	
Benzene	2.960
Toluene	0.454
Ethylbenzene	0.610
Xylenes	1.520
Trimethylbenzenes	0.000
Butylbenzene	0.000

**AREA NOTES**  
Apply Top-down. Apply 27-29 ft at 12 gallons per foot. From 29-34 ft apply at 19 gallons per foot. From 34-40 apply at 12 gallons per foot.

Isopropylbenzene	0.000
Naphthalenes	0.313
MTBE	0.500
TPH-GRO	13.860
TPH-DRO	0.000
TPH-ORO	0.000

### ORC Advanced® Application Design Summary

ORC Advanced® Application Design Summary		
ORC-A	Field App Instructions	
Application Method	Direct Push	
Spacing Within Rows (ft)	6.0	
Spacing Between Rows (ft)	6.0	
Application Points	28	
Areal Extent (square ft)	1,000	
Top Application Depth (ft bgs)	27	
Bottom Application Depth (ft bgs)	40	
ORC Advanced to be Applied (lbs)	720	<b>Field Mixing Ratios</b>
ORC Advanced per point (lbs)	26	Water per Pt (gals)
Percent Slurry	30%	7
Volume Water (gals)	201	ORC Advanced per Pt (lbs)
Volume ORC Advanced (gals)	32	26
Total Application Volume (gals)	234	Total Volume per Pt (gals)
Injection Volume per Point (gals)	8	8

## **APPENDIX C – SDSs**



## 1. Identification

**Product identifier** PetroFix  
**Other means of identification** None.  
**Recommended use** Remediation of contaminants in soil and groundwater.  
**Recommended restrictions** None known.

### Manufacturer/Importer/Supplier/Distributor information

**Company Name** Regenesis  
**Address** 1011 Calle Sombra  
 San Clemente, CA 92673 USA  
**General information** 949-366-8000  
**E-mail** CustomerService@regenesis.com

**Emergency phone number** For Hazardous Materials Incidents ONLY (spill, leak, fire, exposure or accident), call CHEMTREC 24/7 at:  
**USA, Canada, Mexico** 1-800-424-9300  
**International** 1-703-527-3887

## 2. Hazard(s) identification

**Physical hazards** Not classified.  
**Health hazards** Not classified.  
**OSHA defined hazards** Not classified.

### Label elements

**Hazard symbol** None.  
**Signal word** None.  
**Hazard statement** The mixture does not meet the criteria for classification.

### Precautionary statement

**Prevention** Observe good industrial hygiene practices.  
**Response** Wash hands after handling.  
**Storage** Store away from incompatible materials.  
**Disposal** Dispose of waste and residues in accordance with local authority requirements.

**Hazard(s) not otherwise classified (HNOC)** None known.

**Supplemental information** None.

## 3. Composition/information on ingredients

### Mixtures

Chemical name	CAS number	%
Activated carbon <10 µm	7440-44-0	>25
Calcium sulfate dihydrate	10101-41-4	<10
Additive	-	<2

**Composition comments** All concentrations are in percent by weight unless otherwise indicated. Components not listed are either non-hazardous or are below reportable limits. Chemical ingredient identity and/or concentration information withheld for some or all components present is confidential business information (trade secret), and is being withheld as permitted by 29 CFR 1910.1200(i).

## 4. First-aid measures

<b>Inhalation</b>	Move to fresh air. Call a physician if symptoms develop or persist.
<b>Skin contact</b>	Wash off with soap and water. Get medical attention if irritation develops and persists.
<b>Eye contact</b>	Rinse with water. Get medical attention if irritation develops and persists.
<b>Ingestion</b>	Rinse mouth. Get medical attention if symptoms occur.
<b>Most important symptoms/effects, acute and delayed</b>	Direct contact with eyes may cause temporary irritation.
<b>Indication of immediate medical attention and special treatment needed</b>	Treat symptomatically.
<b>General information</b>	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

## 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO <sub>2</sub> ).
<b>Unsuitable extinguishing media</b>	None known.
<b>Specific hazards arising from the chemical</b>	During fire, gases hazardous to health may be formed. Combustion products may include: carbon oxides, nitrogen oxides, sulfur oxides, calcium oxide.
<b>Special protective equipment and precautions for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
<b>Fire fighting equipment/instructions</b>	Move containers from fire area if you can do so without risk.
<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials.
<b>General fire hazards</b>	This material will not burn until the water has evaporated. Residue can burn. When dry may form combustible dust concentrations in air.

## 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.
<b>Methods and materials for containment and cleaning up</b>	Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.  Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.  Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
<b>Environmental precautions</b>	Avoid discharge into drains, water courses or onto the ground.

## 7. Handling and storage

<b>Precautions for safe handling</b>	Avoid prolonged exposure. Observe good industrial hygiene practices.
<b>Conditions for safe storage, including any incompatibilities</b>	Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

## 8. Exposure controls/personal protection

### Occupational exposure limits

#### US. OSHA Table Z-3 (29 CFR 1910.1000)

Components	Type	Value	Form
Activated carbon <10 µm (CAS 7440-44-0)	TWA	5 mg/m <sup>3</sup>	Respirable fraction.
		15 mg/m <sup>3</sup>	Total dust.

#### US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Activated carbon <10 µm (CAS 7440-44-0)	TWA	2 mg/m <sup>3</sup>	Respirable fraction.

**US. ACGIH Threshold Limit Values**

Components	Type	Value	Form
Calcium sulfate dihydrate (CAS 10101-41-4)	TWA	10 mg/m3	Inhalable fraction.

**Biological limit values**

No biological exposure limits noted for the ingredient(s).

**Appropriate engineering controls**

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

**Individual protection measures, such as personal protective equipment****Eye/face protection**

Wear safety glasses with side shields (or goggles).

**Skin protection****Hand protection**

Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

**Skin protection****Other**

Wear suitable protective clothing.

**Respiratory protection**

In case of insufficient ventilation, wear suitable respiratory equipment.

**Thermal hazards**

Wear appropriate thermal protective clothing, when necessary.

**General hygiene considerations**

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

**9. Physical and chemical properties****Appearance****Physical state**

Liquid.

**Form**

Aqueous suspension.

**Color**

Not available.

**Odor**

Not available.

**Odor threshold**

Not available.

**pH**

8 - 10

**Melting point/freezing point**

Not available.

**Initial boiling point and boiling range**

212 °F (100 °C)

**Flash point**

Not available.

**Evaporation rate**

Not available.

**Flammability (solid, gas)**

Not applicable.

**Upper/lower flammability or explosive limits****Flammability limit - lower (%)**

Not available.

**Flammability limit - upper (%)**

Not available.

**Vapor pressure**

Not available.

**Vapor density**

Not available.

**Relative density**

Not available.

**Solubility(ies)****Solubility (water)**

Not available.

**Partition coefficient (n-octanol/water)**

Not available.

**Auto-ignition temperature**

Not available.

**Decomposition temperature**

Not available.

**Viscosity**

Not available.

**Other information****Explosive properties**

Not explosive.

**Oxidizing properties** Not oxidizing.

## 10. Stability and reactivity

**Reactivity** The product is stable and non-reactive under normal conditions of use, storage and transport.

**Chemical stability** Material is stable under normal conditions.

**Possibility of hazardous reactions** No dangerous reaction known under conditions of normal use.

**Conditions to avoid** Contact with incompatible materials. Avoid drying out product. May generate combustible dust if material dries.

**Incompatible materials** Strong oxidizing agents. Acids.

**Hazardous decomposition products** No hazardous decomposition products are known.

## 11. Toxicological information

### Information on likely routes of exposure

**Inhalation** Spray mist may irritate the respiratory system. For dry material: Dust may irritate respiratory system.

**Skin contact** Prolonged or repeated exposure may cause minor irritation.

**Eye contact** Direct contact with eyes may cause temporary irritation.

**Ingestion** May cause discomfort if swallowed.

**Symptoms related to the physical, chemical and toxicological characteristics** Direct contact with eyes may cause temporary irritation.

### Information on toxicological effects

**Acute toxicity** Not expected to be acutely toxic.

Components	Species	Test Results
------------	---------	--------------

Activated carbon <10 µm (CAS 7440-44-0)

#### Acute

##### Oral

LD50	Rat	> 10000 mg/kg
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**Skin corrosion/irritation** Prolonged skin contact may cause temporary irritation.

**Serious eye damage/eye irritation** Direct contact with eyes may cause temporary irritation.

### Respiratory or skin sensitization

**Respiratory sensitization** Not a respiratory sensitizer.

**Skin sensitization** This product is not expected to cause skin sensitization.

**Germ cell mutagenicity** No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

**Carcinogenicity** Not classifiable as to carcinogenicity to humans.

#### IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

#### NTP Report on Carcinogens

Not listed.

#### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not regulated.

**Reproductive toxicity** This product is not expected to cause reproductive or developmental effects.

**Specific target organ toxicity - single exposure** Not classified.

**Specific target organ toxicity - repeated exposure** Not classified.

**Aspiration hazard** Not an aspiration hazard.

## 12. Ecological information

**Ecotoxicity** The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

<b>Persistence and degradability</b>	No data is available on the degradability of this product.
<b>Bioaccumulative potential</b>	No data available.
<b>Mobility in soil</b>	No data available.
<b>Other adverse effects</b>	None known.

### 13. Disposal considerations

<b>Disposal instructions</b>	Collect and reclaim or dispose in sealed containers at licensed waste disposal site.
<b>Local disposal regulations</b>	Dispose in accordance with all applicable regulations.
<b>Hazardous waste code</b>	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
<b>Waste from residues / unused products</b>	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
<b>Contaminated packaging</b>	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

### 14. Transport information

#### DOT

Not regulated as dangerous goods.

#### IATA

Not regulated as dangerous goods.

#### IMDG

Not regulated as dangerous goods.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not established.

### 15. Regulatory information

**US federal regulations** This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

#### **TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

#### **CERCLA Hazardous Substance List (40 CFR 302.4)**

Not listed.

#### **SARA 304 Emergency release notification**

Not regulated.

#### **OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)**

Not regulated.

#### **Superfund Amendments and Reauthorization Act of 1986 (SARA)**

##### **SARA 302 Extremely hazardous substance**

Not listed.

##### **SARA 311/312 Hazardous chemical** No

##### **SARA 313 (TRI reporting)**

Not regulated.

#### **Other federal regulations**

##### **Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

##### **Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)**

Not regulated.

##### **Safe Drinking Water Act (SDWA)** Not regulated.

#### **US state regulations**

##### **US. Massachusetts RTK - Substance List**

Calcium sulfate dihydrate (CAS 10101-41-4)

**US. New Jersey Worker and Community Right-to-Know Act**

Not listed.

**US. Pennsylvania Worker and Community Right-to-Know Law**

Not listed.

**US. Rhode Island RTK**

Activated carbon &lt;10 µm (CAS 7440-44-0)

Calcium sulfate dihydrate (CAS 10101-41-4)

**California Proposition 65**

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**International Inventories**

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

**16. Other information, including date of preparation or last revision**

<b>Issue date</b>	15-February-2018
<b>Revision date</b>	-
<b>Version #</b>	01
<b>HMIS® ratings</b>	Health: 1 Flammability: 1 Physical hazard: 0

**NFPA ratings****Disclaimer**

Regenesis cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

**APPENDIX D – SITE-SPECIFIC HEALTH AND SAFETY PLAN**



# HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

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## HEALTH AND SAFETY PLAN

HIGHWAY 46 FUEL CENTER, INC.  
HIGHWAY 26 FUEL CENTER  
6658 HIGHWAY 46  
HEFLIN, ALABAMA  
CLEBURNE COUNTY

PPM PROJECT NO. 455401-MCAP

MAY 9, 2024



PREPARED UNDER THE DIRECTION OF:  
*JERI F. THRASHER, CSP/MBA / HEALTH AND SAFETY DIRECTOR*  
1600 LAMY LANE, MONROE, LOUISIANA 71201  
(P) 318.812.3454 / (C) 318.884.8188



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# HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

## PROJECT CHECKLIST – HASP AND JSA

### Project/Task and Corresponding Job Safety Analysis:

- |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Chemical Injection<br><input type="checkbox"/> DPVE/SVE/AS System Installation/Decommission<br><input checked="" type="checkbox"/> Drilling/Probing [Hand Auger/Heavy Equipment]<br><input type="checkbox"/> Mobile Vacuum Event [Emergency Response]<br><input type="checkbox"/> Ozone System Installation/Decommission<br><input type="checkbox"/> Other [specify below and contact HSD with details] | <input type="checkbox"/> Remediation System Modification<br><input type="checkbox"/> Spill Bucket Replacement/Closure<br><input type="checkbox"/> Trenching/Excavation<br><input type="checkbox"/> UST Closure<br><input type="checkbox"/> Well Plugging and Abandonment [GIP/Overdrill] |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

*Notes: [Specify type of system and whether install/decommission; identify chemical being injected and notify HSD in advance for new chemical(s); if trenching or excavating; specify whether P&A is GIP or overdrill; specify what system modification is to be conducted.]*

### Hazard Assessment:

Chemical Hazards	Physical/Biological Hazards	Protective Equipment:
<input type="checkbox"/> Acids <input type="checkbox"/> Activated Carbon <input checked="" type="checkbox"/> Alconox®/Liquinox®/Isopropanol <input type="checkbox"/> Asbestos <input type="checkbox"/> Bases/Alkali <input type="checkbox"/> Calibration Gas [Meth/Hex/Hydro/Iso] <input type="checkbox"/> Carbon Dioxide [Dry Ice] <input type="checkbox"/> Chlorinated Solvents [Dry Cleaners] <input type="checkbox"/> Descaling Agents [Analytix AN-754GH] <input type="checkbox"/> Diesel/PAHs <input checked="" type="checkbox"/> Dust [Nuisance/Concrete] <input type="checkbox"/> Dust [Granular Carbon/Aluminum Oxide] <input type="checkbox"/> Fuel Gases [Meth/Hex/Butane/Prop] <input checked="" type="checkbox"/> Gasoline [BTEX] <input type="checkbox"/> Hydrogen Sulfide [H <sub>2</sub> S] <input type="checkbox"/> Kerosene <input type="checkbox"/> Metals [specify metal(s) below] <input checked="" type="checkbox"/> Methyl-Tertiary Butyl Ether [MTBE] <input checked="" type="checkbox"/> Oil [hydraulic/lubricating] <input type="checkbox"/> Oxidizer [specify chemical below] <input type="checkbox"/> Ozone <input type="checkbox"/> Pesticides [Industrial/Agricultural] <input type="checkbox"/> Polychlorinated Biphenyls [PCB] <input checked="" type="checkbox"/> Other* [contact HSD] <input type="checkbox"/> Unknown(s)* [contact HSD]	<input checked="" type="checkbox"/> Biological [specify below] <input type="checkbox"/> Combustion/Flammability <input type="checkbox"/> Compressed Gas [cylinders] <input checked="" type="checkbox"/> Concrete [coring/cutting] <input type="checkbox"/> Crane [subcontractor] <input checked="" type="checkbox"/> Cuts/Lacerations <input checked="" type="checkbox"/> Driving <input type="checkbox"/> Drowning <input type="checkbox"/> Electrical <input type="checkbox"/> Falls [elevated heights] <input type="checkbox"/> Forklift <input checked="" type="checkbox"/> Hand/Power Tools <input checked="" type="checkbox"/> Heat/Cold Stress <input type="checkbox"/> Illumination <input type="checkbox"/> Ladder Safety <input checked="" type="checkbox"/> Material Handling [back safety] <input checked="" type="checkbox"/> Mobile Equipment <input checked="" type="checkbox"/> Noise <input checked="" type="checkbox"/> Repetitive Motion <input checked="" type="checkbox"/> Slips/Trips/Falls <input checked="" type="checkbox"/> Traffic or Secluded Sites <input type="checkbox"/> Uneven Working Surfaces <input type="checkbox"/> Unstable Soils/Cave-Ins <input type="checkbox"/> Other* [contact HSD] <input type="checkbox"/> Unknown(s)* [contact HSD]	<input type="checkbox"/> Apron and Goggles <input type="checkbox"/> Booties/Foot Covers <input checked="" type="checkbox"/> Ear Plugs/Canal Caps <input type="checkbox"/> Face Shield <input type="checkbox"/> Flame-Retardant Clothing <input type="checkbox"/> Hand – Cotton Gloves <input type="checkbox"/> Hand – Kevlar Gloves <input type="checkbox"/> Hand – Leather Gloves <input checked="" type="checkbox"/> Hand – Nitrile Gloves <input type="checkbox"/> Hand – Other* <input checked="" type="checkbox"/> Hard Hat [Class E] <input type="checkbox"/> Harness and Lanyard <input checked="" type="checkbox"/> High Visibility Shirt/Vest <input type="checkbox"/> Personal Flotation Device <input type="checkbox"/> Protective Suits [tyvek]* <input type="checkbox"/> Reflective Shirt/Vest <input type="checkbox"/> Respirator [air-purifying]* <input type="checkbox"/> Respirator [supplied air]* <input type="checkbox"/> Rubber boots <input checked="" type="checkbox"/> Safety Glasses <input checked="" type="checkbox"/> Steel-Toed Boots <input type="checkbox"/> Other* [contact HSD]

### Documentation Required:

- Ambient Air Monitoring
  - Forklift Safety Inspection
  - HASP Acknowledgement Form
  - Incident Report/Log [as applicable]
  - Occupational Noise Monitoring
  - Subsurface Clearance Checklist
  - Tailgate Safety Meeting Log
  - Trench/Excavation Inspection
- Subcontractor-Required (must obtain copy):
- Crane Inspection
  - Forklift Inspection
  - Heavy Equipment Inspection [specify below]
  - One Call
  - Other\* [specify below]

### Return Pages in the Following Order:

- HASP Cover Page
- Project Checklist
- Emergency Summary Information and Maps
- Personnel Roles and Responsibilities, p.3
- One Call (if electronic copy)
- Subsurface Clearance Checklist
- Ambient Air Monitoring Report
- Occupational Noise Monitoring Report
- Crane Inspection (if applicable)
- Forklift Inspection (if applicable)
- Trench/Excavation Checklist
- Incident Report and Log (if applicable)
- HASP Acknowledgement
- Tailgate Safety Meeting Log

HASP Generated By [Print Name]:

Andrew Paradis

Date Generated:

May 9, 2024



# HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

## EMERGENCY SUMMARY INFORMATION

### Medical Facility:

In cases of incidents or near-misses, the Health and Safety Director (HSD) must be verbally contacted immediately once any spills/releases have been contained and appropriately isolated. Incidents resulting in injury or illness must be reported immediately to the HSD for further instruction and injury case management. 911 should be called for life-threatening cases or cases requiring immediate attention. Be prepared to administer CPR and first aid care only if you have been trained to do so, acquire consent from injured worker (unless unconscious in which consent is implied), and training is up-to-date.

Name of Hospital: Southern Immediate Care Phone: 256-568-8818  
 Address: 150 Tompkins St City, State: Heflin, AL Zip: 36264  
 Directions and Map: See attached (next page) Distance: 6 miles Time: 7 min

### Company and Emergency Contact Information:

Agency/Emergency Responder	Telephone	Website
Fire Department / Police Department / Ambulance	911	--
Center for Disease Control and Prevention	800-232-4636	<a href="http://www.cdc.gov">www.cdc.gov</a>
CDC – Public Health Preparedness and Response	404-639-7405	<a href="mailto:cdcinfo@cdc.gov">cdcinfo@cdc.gov</a>
CDC – Bioterrorism Preparedness and Response	404-639-0385	<a href="mailto:cdcinfo@cdc.gov">cdcinfo@cdc.gov</a>
CDC – Toxic Substances and Disease Registry	770-488-7100	<a href="mailto:cdcinfo@cdc.gov">cdcinfo@cdc.gov</a>
Chemtrec [24-Hour Emergency Chemical Spill]	800-262-8200	<a href="mailto:chemtrec@chemtrec.com">chemtrec@chemtrec.com</a>
EPA RCRA Superfund Hotline	800-424-9346	--
Poison Control Center	800-222-1222	<a href="http://www.aapcc.org">www.aapcc.org</a>

PPM Contact Information	Representative	Office	Cell
Principal [Primary Regional Safety PIC]	Shawn Ivey	318-812-3463	318-237-0677
Principal [Alternate Regional Safety PIC]	Zane Hood	205-836-5650	205-240-9883
Health and Safety Director	Jeri Thrasher	318-812-3454	318-884-8188
Safety Supervisor [Baton Rouge]	Jason Beauvais	225-293-7270	337-247-6994
Safety Supervisor [Birmingham]	Brandy Hall	205-836-5650	205-913-5471
Safety Supervisor [Jackson]	Regan Wray	601-956-8233	601-862-8693
Safety Supervisor [Mobile/Pensacola]	Kay Williams	251-990-9000	251-753-4455
Safety Supervisor [Monroe]	Sarah Scott	318-323-7270	225-241-6751
Safety Supervisor [Orlando]	--	407-240-1127	--

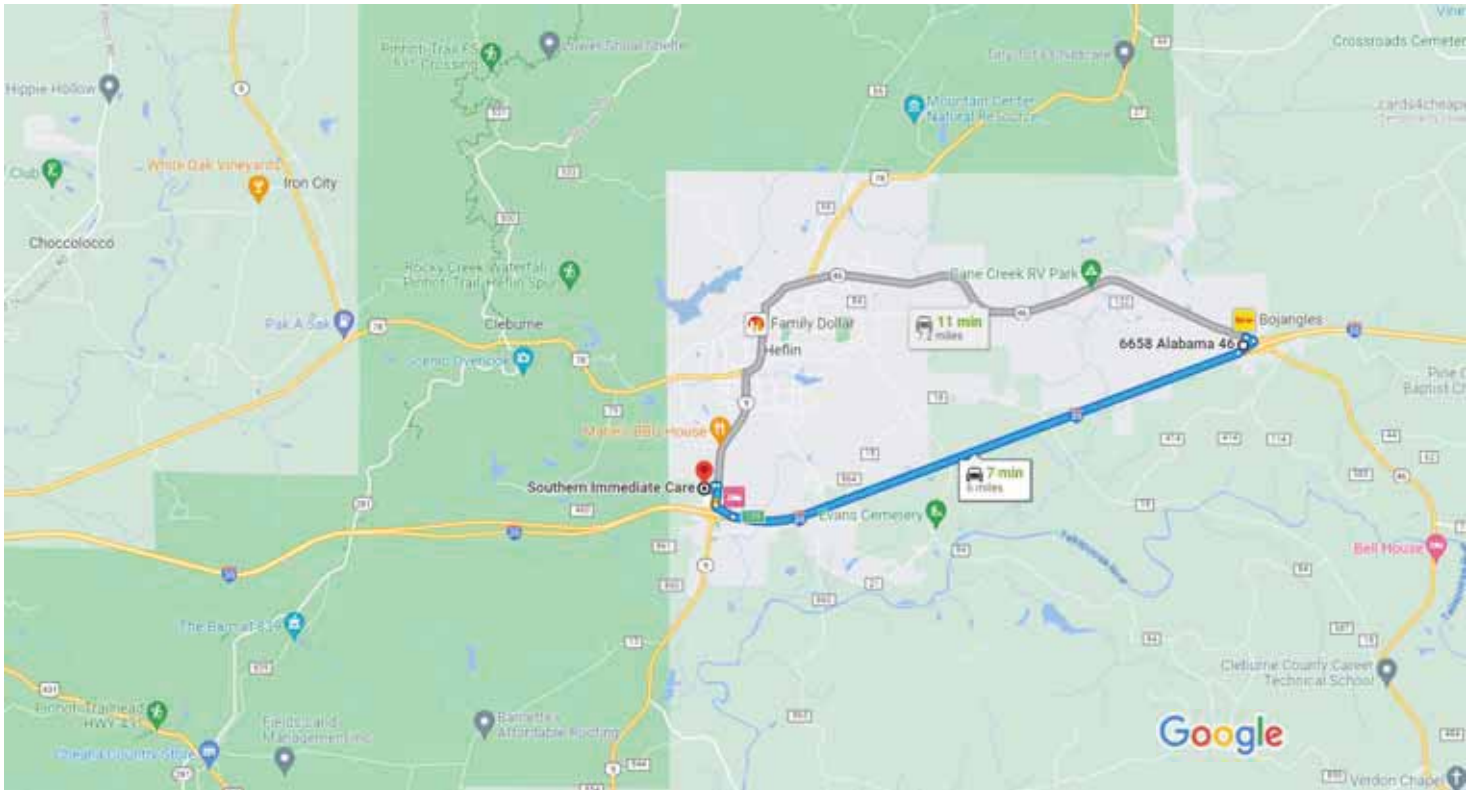
Note: District and Project Managers can be contacted by using the office phone numbers provided for each location. During periods of transition or in the absence of a designated Safety Supervisor, the Health and Safety Director will assume responsibilities.

### Designated Break and Evacuation Locations:

Personal protective equipment is required at all times within the work zone and can only be removed when in the site's designated break area. Smoking will be permitted within the break area pending the site's ambient contaminant concentrations. In the event of an emergency, workers must report to the designated evacuation area for a headcount. This site's designated break and evacuations areas are outlined as follows:

Break Area: \_\_\_\_\_ Evacuation Area: \_\_\_\_\_  
 Break Area: \_\_\_\_\_ Evacuation Area: \_\_\_\_\_  
 Break Area: \_\_\_\_\_ Evacuation Area: \_\_\_\_\_





Map data ©2023 Google 1 mi

6658 AL-46  
Heflin, AL 36264

Get on I-20 W

- \_\_\_\_\_ 50 sec (0.3 mi)
- ↑ 1. Head east on AL-46 E  
\_\_\_\_\_ 397 ft
- ↗ 2. Turn right onto the ramp to Birmingham  
\_\_\_\_\_ 0.2 mi

Follow I-20 W to Almon St. Take exit 199 from I-20 W

- \_\_\_\_\_ 5 min (5.4 mi)
- ↗ 3. Merge onto I-20 W  
\_\_\_\_\_ 5.2 mi
- ↘ 4. Take exit 199 toward Heflin  
\_\_\_\_\_ 0.2 mi

Continue on Almon St to your destination

- \_\_\_\_\_ 2 min (0.3 mi)
- ↗ 5. Merge onto Almon St  
\_\_\_\_\_ 0.2 mi



- ↩ 6. Turn left onto Tompkins St  
\_\_\_\_\_ 210 ft
- ↩ 7. Turn left to stay on Tompkins St  
\_\_\_\_\_ 318 ft
- ↪ 8. Turn right  
\_\_\_\_\_ 187 ft
- ↩ 9. Turn left  
\_\_\_\_\_ 59 ft

**Southern Immediate Care**

150 Tompkins St, Heflin, AL 36264



# HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

## HEALTH AND SAFETY PLAN

### 1.0 INTRODUCTION

---

#### 1.1 COMPANY COMMITMENT

PPM is committed to the safety and wellbeing of its employees and subcontractors. Our mission to simplify the complex is done under the provision that worker health, safety and security is not compromised in the process. In addition, the company strives to ensure that the environment and its natural resources are preserved and not otherwise negatively impacted as the result of company-related processes. This commitment to our workers and our environment is outlined within our written health, safety, security and environmental (HSSE) program, which establishes the company's expectations through its policies and procedures.

#### 1.2 HASP PURPOSE

The purpose of this health and safety plan (HASP) is to mitigate those hazards associated with routine company-related tasks that could not otherwise be substituted or eliminated. This document outlines the control measures, protective equipment and emergency response procedures necessary to ensure worker safety and wellbeing are maintained. This HASP has been prepared in accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 standard for typical conditions encountered during routine business practices.

#### 1.3 APPLICABILITY AND EXCEPTIONS

All field-related projects and/or tasks require a HASP, unless otherwise exempted by the safety department. The provisions outlined within this plan are applicable to all personnel assigned to the project and subcontracted workers hired by the company to complete the project. PPM will not be responsible for the safety of contracted workers hired directly by the client or partnering companies unless otherwise specified by these entities to do so and expressly agreed to, in writing, by all applicable parties. Accountability for the health, safety and security of contractors under these circumstances must be pre-established and explicitly outlined within the proposed scope of work and must additionally be approved by a Principal of the company.

This plan has been prepared specifically for common chemicals and tasks associated with routine business practices. Review and completion of this plan is separated into two categories:

- 1) *Routine and repetitive tasks that do not require field monitoring.* Some examples include: groundwater monitoring, mobile ozone or vacuum events (non-emergency release), system operation and maintenance, environmental assessments/audits, compliance audits, lead/asbestos inspections, and/or other similar non-intrusive tasks. These projects require review of applicable sections of the HASP and requires no field documentation other than HASP acknowledgement.
- 2) *Routine and repetitive tasks that require field monitoring.* Some examples include: drilling, geoprobing, excavating, trenching, chemical injection, remediation system installations or demobilizations, emergency mobile vacuum events (due to chemical releases), and/or other forms of similar sampling and analysis or subsurface disturbances. These projects require a HASP request form be submitted to the Safety Supervisor for preparation and document tracking. They also require review of applicable sections of the HASP and requires field documentation that must be returned to the safety department for recordkeeping.

Any project involving chemical(s), field-related task(s), and/or protective clothing and equipment not otherwise specified within this plan is considered non-routine and requires a site-specific plan be developed by the Health and Safety Director (HSD). When possible, please allow five days for preparation.



- **Health and Safety Director.** The HSD is responsible for proposing and generating HSSE policies/procedures under the advisement of the Authorizing Principals and in accordance with evolving local, state and federal regulations; communicating HSSE requirements to all affected personnel within the organization; and ensuring uniform implementation of these provisions throughout the PPM organization. The HSD also ensures contractual HSSE obligations are fulfilled and sustained.
- **District Manager.** Each branch office has a designated District Manager (DM) who is responsible for ensuring that HSSE policies and procedures are implemented by the workers assigned to his/her office. The DM is directly accountable to the Principals for the safety performance of his/her office.
- **Safety Supervisor.** Each branch office has a designated Safety Supervisor (SS) assigned by the DM. The SS is responsible for ensuring HSSE compliance by all within his/her office through consistent toolbox training, unscheduled site safety inspections and any other tasks delegated by the HSD. The SS is directly accountable to the HSD for his/her supervisory role and is also accountable to his/her DM regarding the office's safety performance.
- **Project Manager.** Each project has a designated Project Manager (PM) who is responsible for the safety and wellbeing of the workers assigned to his/her jobsite(s). The PM establishes the overall scope-of-work for the project and must consider the appropriate safety provisions (i.e., engineering design, protective equipment, etc.) during the planning phase. The PM is directly accountable to their DM for job-related HSSE issues that arise throughout any phase of the project.
- **Site Safety Officer.** A site safety officer (SSO) is assigned to each field project. An alternate SSO is also assigned to any field project with more than one PPM employee onsite. The SSO is responsible for jobsite safety, which includes, but is not limited to, the following:
  - Designate break and evacuation areas based on current site conditions;
  - Review the provisions outlined within the HASP and JSA (as applicable) with all affected personnel, subcontractors, client, and regulatory officials;
  - Ensure site security and prevent unauthorized entry to the work zone;
  - Ensure subsurface utilities have been marked and appropriate Principal approval has been obtained for critical zone disturbances;
  - Locate emergency shut-off devices to pumps and heavy equipment;
  - Establish communication system with equipment operators;
  - Ensure all workers and contractors wear required protective equipment;
  - Prohibit onsite smoking, except when permitted within designated areas;
  - Complete required field documentation outlined within the HASP for worker exposure monitoring and other site safety inspections; and
  - Report to management any incident or near-miss event.

The alternate SSO is responsible for jobsite safety in the absence of the SSO or when under the direction of the SSO.



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## HEALTH AND SAFETY PLAN

The following personnel are assigned to this project:

Name	Title/Position
Michael Ellison	District Manager
Derek Prince	Project Manager
Jeri F. Thrasher, CSP	Health and Safety Director
Andrew Paradis	Safety Supervisor (SS)
TBD	Site Safety Officer (SSO)
TBD	Alternate SSO
Regenesis	Subcontractor

### 2.3 SHORT-SERVICE EMPLOYEES

Short-service employees are defined as any worker employed by PPM for less than six months or workers who have not yet completed required training and certification. Short-service employees are assigned a mentor and supervised at all times when in the field - (exception: establishing offices that do not have a mentor may require that short-service employees perform field duties unsupervised; however, exemption is required by an Authorizing Principal).

### 2.4 TRAINING AND MEDICAL MONITORING

PPM field personnel associated with this project have received company HSSE policy and procedural training as part of their safety orientation. Personnel have additionally received initial 40-Hour HAZWOPER certification, which is updated annually through an 8-Hour refresher. This training course meets the requirements of OSHA 29 CFR 1910.120(e). Short-service employees not otherwise HAZWOPER-certified will be provided training after 90-day probationary period.

In accordance with the medical monitoring requirements outlined within 29 CFR 1910.120(f), workers who are or may potentially be exposed to hazardous materials are provided a medical evaluation paid for by the company. Only those employees who have been medically cleared for duty by a physician are permitted to perform field duties.

## 3.0 HAZARD ASSESSMENT AND CONTROL MEASURES

### 3.1 CHEMICAL HAZARDS AND CONTROLS

PPM is an environmental consulting firm that specializes in environmental spill response, remediation and general regulatory compliance providing services to the energy, commercial, industrial, and private sectors. As part of these functions, workers will likely be exposed to chemical hazards through the following routes: site contamination, chemicals used as part of the remediation process, chemicals used for equipment maintenance and calibrations, and chemicals used/stored at client facilities.

#### 3.1.1 Gases and Fumes

##### 3.1.1.1 Acids

Acids have a pH <7, change litmus paper to red, taste sour (most citrus fruits are acidic), are corrosive to metals, and are commonly found in car/forklift batteries, used as sample preservatives and used to prevent algae, calcium and other similar buildups in piping systems. Common acids encountered through company-related processes include but are not limited to: hydrochloric (muriatic), nitric, phosphoric and sulfuric acid. Acids can cause moderate to severe skin and eye burns, and breathing the fumes created by these materials can cause extreme



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burning of the respiratory system. Materials with a pH <2 must be disposed as a hazardous waste; however, acids can be neutralized with a base/alkali.

*Control Measures:* Never pour water into acid! Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Thoroughly wash exposed skin and hands upon completion of handling to avoid skin/eye irritations, itching and burning and prevent accidental ingestion. Prevent contact with metals.

### 3.1.1.2 Bases/Alkali

Commonly referred to as caustics, bases have a pH >7, change litmus paper to blue, have a bitter taste, feel slippery and are commonly used to make soap and textiles, found in common household detergents, cleaners (i.e., Drano, oven cleaners and ammonia products), milk of magnesia and antacids. Common bases encountered through company-related processes include but are not limited to: sodium hydroxide, potassium hydroxide, calcium hydroxide, ammonia, and sodium carbonate. Bases can cause moderate to severe skin and eye burns, and breathing the fumes created by these materials can cause extreme burning of the respiratory system and pulmonary edema. Materials with a pH >12.5 must be disposed as a hazardous waste. While bases react violently with acids, they can also be neutralized by acids.

*Control Measures:* Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Thoroughly wash exposed skin and hands upon completion of handling to avoid skin/eye irritations, itching and burning and prevent accidental ingestion.

### 3.1.1.3 Calibration and Fuel Gases

Calibration gases are used to calibrate air monitoring equipment. Common calibration gases used for equipment calibration include: hexane, hydrogen, isobutylene and methane. Calibration gases are used in small quantities, are highly flammable, and must be stored and handled safely. Gases such as hexane, methane, butane, and propane are used as fuel sources and may be encountered in larger quantities at oil and gas facilities. Workers may also come across methane gas through work in landfills, swamps, and agricultural land associated with raising livestock.

*Control Measures:* Keep containers upright, lids secured and store in climate-controlled environment away from heat sources. Calibration gases are asphyxiants (displace oxygen) so calibrate equipment in well-ventilated areas. When these gases are anticipated in larger quantities, workers must air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment.

### 3.1.1.4 Carbon Dioxide (Dry Ice)

Dry ice is carbon dioxide in a solid form. It may be used as a refrigerant and/or to displace vapors and has been used on some PPM jobsites for such purposes. Some hazards associated with the use of dry ice include, but are not limited to: frostbite through direct skin contact, asphyxiation due to displacement of oxygen in the atmosphere, and explosion from release of pressure exerted by the conversion of carbon dioxide solid to gas which could produce projectiles of the dry ice.



Control Measures: Avoid direct contact with solid dry ice to prevent frostbite. Avoid storing in areas with limited air flow (ventilation) such as buildings, vehicles, or other confined areas where gases can accumulate and be inhaled. Store inside a paper bag within a refrigerator, freezer, or cooler with a tight seal.

### 3.1.1.5 Hydrogen Sulfide

Hydrogen sulfide ( $H_2S$ ) is a colorless gas known for its pungent odor (often referred to as a “rotten egg” odor) at low concentrations. It is a highly flammable and toxic substance associated with oil and gas refining, mining, tanning, pulp and paper processing, and rayon manufacturing. It can also occur naturally in sewers, well water, oil and gas wells, manure pits, and volcanoes. Hydrogen sulfide is heavier than air so it settles in low-lying enclosed areas such as manholes, sewers, and underground telephone vaults. Another characteristic of hydrogen sulfide is that it fatigues a worker’s sense of smell so it cannot be relied upon in determining the continuous presence of  $H_2S$  gas. Health effects depend upon the exposure concentration and include, but are not limited to: irritation of eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (tears), photophobia (intolerance to light), corneal vesiculation; dizziness, headache, weakness, exhaustion, irritability, insomnia; gastrointestinal disturbance; as a liquid: frostbite.

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Wear personal monitoring badges for  $H_2S$  within the breathing zone. Where applicable, rely upon stationary monitoring devices and when alarms are triggered, evacuate the area upwind immediately. Use escape only respiratory protection when issued by PPM and/or the client facility.

### 3.1.2 Oxidizers

#### 3.1.2.1 Hydrogen Peroxide (30-50%)

Hydrogen peroxide is a colorless liquid with a slightly sharp odor. It is a powerful oxidizer injected into subsurface soils, in conjunction with ozone, for the treatment of contaminants such as MTBE, BTEX, hydrocarbons – aliphatic and polyaromatic, diesel fuel, chlorinated solvents, VOCs, and pesticides. It is generally noncombustible, but upon contact with a combustible material, may result in spontaneous combustion. Direct contact may result in severe skin and eye damage. Symptoms of exposure include: irritation of eyes, nose, and throat; corneal ulcer; burning and redness of skin; and bleaching of hair.

Control Measures: Because hydrogen peroxide is injected into subsurface soils, worker exposures will likely result from a release at the monitoring wellhead, sparge point or other similar avenues that will lead the substance to ground surface. Therefore, workers must routinely air monitor around sparge points and monitoring wells for evidence of leakage. Collections must occur at the wellhead (source) as well as within the breathing zone of the worker. Hydrogen peroxide is injected into the subsurface via tubing from storage containers of liquid hydrogen peroxide so workers may have direct contact with these storage containers during initial setup and when replacing empty containers with new containers. Wear face shields, elbow-length gloves, and aprons as necessary to prevent direct contact with substance, and workers must keep face away from the source while collecting ambient air samples to avoid potential inhalation exposures and splash hazards.

#### 3.1.2.2 Oxygen Release Compound® (ORC) and ORC Advanced®

ORC® and ORC Advanced® are forms of enhanced aerobic bioremediation which supplies oxygen to accelerate the biodegradation of soil and groundwater contaminants. Both materials are a white powder that gets mixed with water and injected in subsurface soils. Once mixed, these

materials have a pH of 10 [ORC] and 11-13 [ORC Advanced], making them a significant skin and eye irritant. Symptoms of exposure include: cough, sore throat, nose bleeds (extended exposures), eye watering and redness, eye lesions (extended exposures), nausea and vomiting if ingested and skin irritation.

*Control Measures:* When in powder form, this material is to be treated as a nuisance dust. Avoid creating dusty environments during the mixing process. When dealing with unknown dust concentrations, wear air-purifying respirator with P-100 HEPA filter until product becomes slurry mixture. Wear nitrile, neoprene or rubber gloves for hand protection and safety glasses or goggles for eye protection. Avoid storing oxidizers near combustible materials, other strong oxidizers, strong acids or other strong chemical agents. etc. (see safety data sheet for complete list of incompatibles).

### 3.1.2.3 Ozone

Ozone is a pale, blue gas with a distinctive odor similar to that of chlorine bleach and can be smelled at relatively low concentrations. It is a powerful oxidizer injected into subsurface soils for the treatment of contaminants such as MTBE, BTEX, hydrocarbons – aliphatic and polyaromatic, diesel fuel, chlorinated solvents, VOCs, and pesticides. Symptoms of exposure include: dryness of mouth, coughing, irritation to nose, throat and chest; difficult breathing, headache, and fatigue; eye irritation causing pain, lacrimation (tears) and inflammation.

*Control Measures:* Because ozone is injected into subsurface soils, worker exposures will likely result from a release at the monitoring wellhead, sparge point or other similar avenues that will lead the substance to ground surface. Workers must consistently air monitor sparge points and monitoring wells for evidence of ozone leakage. Collections must occur at the wellhead (source) as well as within the breathing zone of the worker. Ozone rapidly converts into O<sub>2</sub>, CO<sub>2</sub> and other less toxic molecules but exposure limits can be triggered at the wellhead so workers must keep face away from the source while collecting the sample until it can be confirmed that the sample is acceptable for worker exposure.

Although this system has built-in safety features which shut down the system if a leak is detected, sometimes ozone concentrations can build up inside the mobile ozone trailer. Workers should use caution when opening door and should keep door open while in use to allow for ventilation.

### 3.1.2.4 RegenOx A and B™

RegenOx™ is an oxidizing compound comprised of two parts (A and B) that is injected into subsurface soils as part of in-situ remediation. Part A is a white, odorless powder with a pH of 10.5 and is the oxidizer/catalyst component of this mixture. Part B is a blue/green, odorless liquid with a pH of 11 and is the activator complex. Both parts are mixed together prior to subsurface injection. The mixing of these materials is a relatively safe process but exposures can result in skin, eye, respiratory and gastrointestinal irritations. Symptoms include: coughing, shortness of breath, irritation to mucous membranes, nose and throat; skin and eye itching/redness; vomiting and diarrhea associated with ingestion [Part A] and irritation to mouth, esophagus and stomach [Part B].

*Control Measures:* When mixing materials, wear protective clothing such as neoprene, rubber or PVC gloves for hand protection and goggles or face-shield for eye protection. Avoid storing oxidizers near combustible materials, other strong oxidizers, acids, bases, salts of heavy metals, reducing agents, etc. (see safety data sheet for complete list of incompatibles).

### 3.1.3 Particulates and Fibers

Particulates are commonly referred to as particulate matter and consist of pieces of solid matter suspended in a gas or liquid. Particulate matter can occur naturally or be man-made. Fibers consist of continuous filaments or elongated pieces like those similar to thread. Fibers are used to produce various materials such as paper, rope, and clothing. The common types of particulates and fibers encountered by personnel are outlined in the following sections.

#### 3.1.3.1 Aluminum Oxide

Aluminum oxide is a byproduct generated by ozone remediation systems. Condensation forms on aluminum metal parts which when combined with oxygen creates a white, odorless, crystalline powder scale which can build up on metal parts of the system and presents a potential contact, inhalation, and/or ingestion exposure to workers. Aluminum oxide is a noncombustible solid, is not considered carcinogenic, and may include symptoms such as irritation of eyes, skin, and respiratory system.

*Control Measures:* To eliminate contact exposures, workers must wear chemical-resistant gloves and aprons to remove powder scale buildup from aluminum piping during routine system maintenance. Workers should avoid creating dust buildup of this substance, and when this cannot otherwise be avoided, workers must upgrade to respiratory equipment with P-100 filter to prevent inhalation of this material.

#### 3.1.3.2 Asbestos

Asbestos is a naturally-occurring fibrous material used in many products due to its attractive features. Asbestos has tensile strength, can easily be woven, and is heat and chemical resistant. It is most commonly found in roofing shingles, floor and ceiling tiles, textiles, coatings, paper and cement products, piping insulation and friction products such as automobile clutch, brake and transmission parts. The three most common forms of asbestos include:

- **Amosite (brown asbestos).** Amphibole fiber formation (straight, needle-like fibers). Originated in Africa and used industrially as a fire retardant in thermal insulation, used in cement sheeting and is also found in ceiling tiles.
- **Chrysotile (white asbestos).** Serpentine fiber formation (curled fibers). Is less friable (less-likely to be inhaled) than other types of asbestos and therefore viewed by many to be the safest type of the asbestos, which is why it is the most common form of asbestos used in the U.S. mostly in the form of building materials.
- **Crocidolite (blue asbestos).** Amphibole fiber formation (straight, needle-like fibers). Originated in South Africa and Australia and used for thermal and chemical insulation as well as construction piping and water casings. Is considered to be the most dangerous type of asbestos.

When asbestos is disturbed through repairs, remodeling or demolition, airborne fibers can be inhaled by workers causing respiratory diseases such as lung cancer, asbestosis and mesothelioma – all of which have a latency period between exposure and onset of symptoms. These respiratory diseases are chronic in nature and generally irreversible. Smokers are more susceptible to the damaging health effects of asbestos exposures. Symptoms of asbestos exposure include: shortness of breath, difficult breathing or swallowing, persistent coughing that progressively worsens, wheezing and hoarseness, coughing up blood, pain or tightening in the chest, swelling of face or neck, loss of appetite, weight loss, fatigue or anemia.

*Control Measures:* Asbestos-containing areas must be identified by signs, which will likely be found when working at larger industrial and commercial facilities. In these cases, workers must avoid these areas and take all necessary precautions to prevent disturbing any materials within these areas. In most cases, potential asbestos exposures will be in the form of sample collection as part of environmental site assessments performed on commercial properties. Personnel must be certified asbestos inspectors to perform these collections. In some cases, demolition of structures potentially containing asbestos materials may be supervised. At a minimum, the designated PPM-representative must be asbestos certified; however, the demolition and air monitoring requirements will be subcontracted to an appropriately state-certified contractor.

Because the sample collection process disturbs asbestos-containing materials (ACM) or potential asbestos-containing materials (PACM), workers must wear air-purifying respiratory protection in the form of half-mask respirator with P-100 high efficiency particulate air (HEPA) filters and must also wet the sample area with a soap-water mixture to reduce the dispersion of fibers. *Note: asbestos-containing materials will be presumed until otherwise verified through laboratory analysis. Buildings constructed prior to the 1980s have a greater likelihood of containing asbestos. PACMs must be treated as if they contain asbestos, and the greatest level of control should be used when collecting samples.*

### 3.1.3.3 Heavy Metals

Numerous heavy metals bind naturally to soils; therefore, dusty environments can introduce these hazards to workers. Heavy metals are poisonous to humans and can cause severe health effects due to their proven or suspected carcinogenic characteristics. Common heavy metals encountered through company-related processes include:

- **Aluminum.** A silvery-white, malleable, ductile, and odorless solid (metal); combustible as a solid (although takes effort), but easily ignitable when in fine dust form which can cause explosions; can cause damage to the eyes, skin and respiratory system; symptoms include: skin, eye and respiratory irritation.
- **Arsenic.** A silver-gray or tin-white metal commonly associated with under-ground storage tanks; noncombustible in solid form but presents slight explosion hazard in dust form when exposed to flame; is considered potential lung and lymphatic system carcinogen and can also affect liver, kidneys and skin through inhalation, skin absorption, skin/eye contact and ingestion exposures; symptoms include: respiratory irritations such as ulceration of nasal septum, dermatitis, gastrointestinal disturbances, hyperpigmentation (darkening) of the skin, and peripheral neuropathy (problem with nerves that carry information to and from the brain and spinal cord which can result in pain, loss of sensation and inability to control muscles).
- **Barium.** A silvery-white metal that exists naturally in the environment; because it is very reactive in its natural state, it is often combined with other elements such as oxygen, carbon and sulfur; it has many uses, but one likely exposure source is that it is used by the oil and gas industry to make drilling mud, which lubricates the drill and simplifies the process when drilling through rock; barium in its natural state is highly flammable and reacts violently with water; may cause irritation of skin, eye, nose, throat and upper respiratory tract, allergic reactions, and central nervous system damage; symptoms include: corneal damage including blindness, poisoning, dermatitis, and skin, eye and throat burns.
- **Cadmium.** A soft, bluish-white metal commonly associated with underground storage tanks; noncombustible in solid form but will burn in powder form; is considered potential prostate and lung carcinogen and can also affect respiratory system, kidneys and blood through inhalation and ingestion exposures; symptoms include: pulmonary



edema (fluid in air sacs of lungs) which causes difficult breathing, cough, chest tightness, substernal pain, headache, chills, muscle aches, nausea, vomiting, diarrhea, loss of smell, emphysema, proteinuria (protein in urine), and mild anemia.

- **Chromium.** A hard, steel-gray metal commonly associated with underground storage tanks; noncombustible in solid form but finely dispersed dust particles will rapidly burn when exposed to a flame; chromium is not considered a likely carcinogen, but does affect skin, eyes and respiratory system through inhalation, ingestion and contact exposures; symptoms include: skin and eye irritation and lung fibrosis (scarring of the lungs).
- **Copper.** A soft, malleable reddish-orange metal commonly associated with underground storage tanks; noncombustible in solid form but may ignite when in powder form; copper is not considered a likely carcinogen, but does affect skin, eyes, respiratory system, liver and kidneys through inhalation, ingestion and contact exposures; symptoms include: skin, eye and pharynx irritation, nasal septum perforation, metallic taste, and dermatitis.
- **Iron.** A lustrous metal with a grayish tinge commonly used in industry in the construction of machinery, tools, automobiles, ships and building components; it is the most commonly used of all metals and can also be found in numerous dietary sources; elevated iron in the blood can react with peroxides to produce free radicals that can damage DNA, proteins, lipids and other cellular components; upon exposure, iron can cause skin, eye, mucous and respiratory irritations; it is also flammable as a fine dust.
- **Lead.** A soft, gray metal commonly associated with underground storage tanks, paints and coatings; noncombustible in solid form; lead is not considered a likely carcinogen, but does affect eyes, gastrointestinal tract, central nervous system, kidneys, blood and gingival tissue (soft tissue of the mouth surrounding the teeth) through inhalation, ingestion and contact exposures; symptoms include: eye irritation, weakness, exhaustion, insomnia, facial pallor (paleness), weight loss/anorexia, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, tremor, paralysis of wrist and ankles, encephalopathy (various brain disorders), kidney disease, and hypertension.
- **Magnesium.** A strong, silvery-white, light-weight metal that exists naturally in the environment; because it is very reactive in its natural state, it is often combined with other elements to form magnesium oxide, various salts, and other industrially-important compounds; magnesium is the third most commonly used metal; because it is light-weight, it is widely used in manufacturing numerous electronics; upon exposure, magnesium can cause skin and eye irritations; it is also flammable as a fine dust.
- **Mercury.** A silver-white, liquid metal associated with underground storage tanks, batteries, fluorescent bulbs, thermometers and thermostats; noncombustible liquid; mercury is not considered a likely carcinogen but does affect skin, eyes, respiratory system, central nervous system and kidneys through inhalation, skin absorption, ingestion and contact exposures; symptoms include: skin and eye irritation, cough, chest pain, difficult breathing, bronchitis, pneumonia (lung inflammation), tremor, insomnia, irritability, indecision, headache, weakness, exhaustion, stomatitis (inflammation of lining within the mouth), salivation, gastrointestinal disturbance, weight loss/anorexia, and proteinuria (protein in urine).
- **Selenium.** Crystalline, red to gray solid that is considered to be combustible when in fine dust form; elemental selenium is rare – it is most commonly produced as a byproduct of refining copper or producing sulfuric acid; selenium can cause damage to the skin, eyes, respiratory system, liver, kidneys, blood and spleen; symptoms include:

skin, eye, nose, and throat irritations, visual disturbance, headache, chills, fever, difficulty breathing, bronchitis, metallic taste, garlic breath, gastrointestinal disturbance, dermatitis, and skin and eye burns.

- **Silver.** A white, lustrous metal that is noncombustible in solid form but can become flammable when in dust form. Silver can cause damage to the nasal septum, skin and eyes. Symptoms include: blue-gray eyes, nasal septum, throat and skin, ulceration of skin, and gastrointestinal disturbance.
- **Zinc.** A bluish-white metal commonly associated with underground storage tanks and used as an anti-corrosion agent; zinc is commonly found in common cold lozenges and over-the-counter cold remedies, as a dietary supplement and also within common foods such as beans, nuts, whole grains and pumpkin/sunflower seeds; zinc is commonly considered non-toxic but in abundance can result in gastrointestinal irritation through ingestion exposures; symptoms include: loss of appetite, nausea, vomiting, stomach cramps, diarrhea and headaches.

*Control Measures:* Soils should be wet and kept damp to reduce the amount of airborne dust concentrations generated. Providing sufficient ventilation, wearing safety glasses with side-shield protection and wearing dust masks or respiratory equipment with P100 filter are other alternatives for working in dusty environments. Most PPM jobsites can be mitigated using wet methods only. Workers should use additional precautions when using both wet methods and power tools or corded equipment to avoid electrical shock. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion.

#### 3.1.3.4 Nuisance and Concrete Dust

Dust generation is a common occurrence when working with contaminated soils and when mixing or dismantling concrete. In most cases, activities that result in dust accumulation are subcontracted making them more susceptible to these respiratory hazards than PPM personnel. Generally, dust accumulation is minimal, but the SSO must ensure that subcontractors are using effective controls to minimize dust accumulation, and that they are also equipped and wearing the appropriate protective equipment when performing these tasks. Contaminants associated with common job-related dusty environments include:

- **Total and respirable dust.** Dust found in the air that can cause breathing difficulties if inhaled. OSHA has established permissible exposure limits (PELs) for both total and respirable dusts to regulate worker exposures. Respirable dust is defined as dust particles less than 10 micrometers in diameter, which is too small to be visible. Symptoms of exposure can include coughing, wheezing and breathing difficulties.
- **Concrete dust.** Commonly generated through core drilling and jack-hammering through concrete. Also, small areas of concrete can be replaced by workers who may generate dusts from bags of cement as part of the mixing process. Trace amounts of crystalline silica, alkaline compounds and hexavalent chromium are found within cement. OSHA has established PELs for Portland cement to regulate worker exposures. Symptoms of exposure can include coughing, wheezing, eye irritations and in severe cases silicosis.

*Control Measures:* Soils should be wet and kept damp to reduce the amount of airborne dust concentrations generated. Providing sufficient ventilation, wearing safety glasses with side-shield protection and wearing dust masks or respiratory equipment with P100 filter are other alternatives for working in dusty environments. Most PPM jobsites can be mitigated using wet methods only. Workers should use additional precautions when using both wet methods and



power tools or corded equipment to avoid electrical shock. Wet cement can also cause skin burns so workers should wear goggles, aprons or long-sleeved clothing, and hand protection when mixing cement. Wash skin immediately and thoroughly if exposed to wet cement.

### 3.1.4 Volatile and Semi-Volatile Organic Compounds

Volatile organic compounds (VOCs) are a broad group of materials that have the ability to vaporize (change from a solid or liquid into a gas) with an increase in ambient temperature. Some example VOCs include: paints and lacquers, paint thinners, pesticides, solvents and degreasers, glues/adhesives and petroleum fuels. Semi-volatile organic compounds (SVOCs) include phenols and polycyclic aromatic hydrocarbons (PAHs), which have a higher boiling point than water and may vaporize with an increase in ambient temperature. VOC/SVOCs are not known for acute toxicity but have significant chronic health effects because concentrations are often low and symptoms are slow to develop, which is why several VOC/SVOCs are suspected or known carcinogens. Common VOC/SVOCs are outlined in the following sections.

#### 3.1.4.1 Chlorinated Compounds

A chlorinated solvent is a type of organochlorine, which is an organic compound (contains carbon) that also contains chlorine. They are found in a variety of products and used as part of the dry cleaning process due to its ability to dissolve materials such as fats and greases. Workers are most likely to be exposed to these chemicals as part of soil and groundwater assessment and remediation associated with dry cleaning contaminants. Chlorinated solvents can be environmentally persistent and tend to evaporate easily making inhalation the primary route of worker exposure. However, workers may additionally be exposed to chlorinated solvents through ingestion, absorption and skin/eye contact. Common chlorinated solvents encountered through company-related processes include:

- **Carbon tetrachloride.** A noncombustible, colorless liquid with ether-like odor; considered a potential carcinogen with damaging effects to the central nervous system, eyes, lungs, liver, kidneys, and skin; symptoms include: skin and eye irritation, central nervous system depression, nausea, vomiting, drowsiness, dizziness, and incoordination.
- **Chloroform.** A noncombustible, colorless liquid with pleasant odor; considered a potential carcinogen with damaging effects to the liver, kidneys, heart, eyes, skin, and central nervous system; symptoms include: skin and eye irritation, dizziness, mental dullness, nausea, confusion, headache, weakness, exhaustion, anesthesia, and enlarged liver.
- **Methylene chloride.** A combustible, colorless liquid with chloroform-like odor; considered a potential carcinogen with damaging effects to the eyes, skin, cardiovascular system, and central nervous system; symptoms include: skin and eye irritation, weakness, exhaustion, drowsiness, dizziness, numb and tingling limbs, and nausea.
- **Perchloroethylene (Tetrachloroethylene).** A noncombustible, colorless liquid with mild chloroform-like odor; when in a fire, it decomposes to hydrogen chloride and phosgene; considered a potential carcinogen with damaging effects to the eyes, skin, respiratory system, liver, kidneys and central nervous system; symptoms include: skin, eye, nose, throat and respiratory irritation, nausea, flushed face and neck, dizziness, incoordination, headache, drowsiness, skin redness, and liver damage.

- **Trichloroethylene.** A combustible, colorless liquid with chloroform-like odor; will burn when exposed to flame, but is difficult to burn; considered a potential carcinogen with damaging effects to the eyes, skin, respiratory system, heart, liver, kidneys, and central nervous system; symptoms include: skin and eye irritation, headache, visual disturbance, weakness, exhaustion, dizziness, tremor, drowsiness, nausea, vomiting, dermatitis, cardiac arrhythmias, parasthesia (tingling or numbness of the skin), and liver injury.
- **Vinyl chloride.** A combustible, colorless gas or liquid (below 7° F) with pleasant odor at high concentrations; considered a potential carcinogen with damaging effects to the liver, central nervous system, blood, respiratory system, and lymphatic system; symptoms include: weakness, exhaustion, abdominal pain, gastrointestinal bleeding, enlarged liver, pallor or cyanosis of extremities, and frostbite (as a liquid).

*Control Measures:* Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

### 3.1.4.2 Isopropyl Alcohol

After bailers and reusable sampling equipment is decontaminated withalconox® solution, it is then sprayed with isopropyl alcohol. Also referred to as isopropanol, isopropyl alcohol is a colorless, flammable liquid commonly known as rubbing alcohol. It is considered a skin, eye and respiratory system irritant that causes damage through inhalation, ingestion and skin/eye contact exposures. Symptoms of overexposure include: irritation of eyes, nose and throat, drowsiness, dizziness, headache and dry, cracking skin.

*Control Measures:* Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Increase frequency of air monitoring if action limits are triggered and remove or isolate all ignition sources if flammability limits are triggered. Thoroughly wash exposed skin and hands upon completion of handling to avoid skin/eye irritations.

### 3.1.4.3 Methyl-Tertiary Butyl Ether (MTBE)

MTBE is a colorless, flammable liquid with an ether-like odor used as a fuel additive to reduce emission gases such as ozone and carbon monoxide. At one point gasoline could consist of as much as 10-15% MTBE but has since been replaced with ethanol and other additions less harmful to humans and the environment. MTBE poses a concern because it is considered a potential human carcinogen, can easily travel through soils, and is very soluble in water creating larger contaminant plumes than other gasoline constituents. It is also more resistant to biodegradation making it more environmentally persistent. MTBE is considered a skin, eye, respiratory and central nervous system irritant with symptoms that include: skin, eye and mucous membrane irritation, dizziness, nausea, headache, intoxication, loss of balance and coordination, unconsciousness, coma, respiratory failure and death.

*Control Measures:* Avoid prolonged exposures to oil mist, liquid or vapor. Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective

equipment. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

#### 3.1.4.4 Organic Hydrocarbons

Total petroleum hydrocarbon (TPH) is a broadly used term referring to a large family of compounds that originate from crude oil. Crude oil is a naturally-occurring, flammable liquid comprised of a complex mixture of various hydrocarbons. It is recovered through oil drilling, but can be refined and separated into other substances such as gasoline, kerosene, diesel and lubricating oils. TPH is generally comprised of hydrogen and carbon; hence the term "hydrocarbon". Because there are so many different mixtures, TPH is divided into groups or fractions, and each fraction consists of hydrocarbons that exhibit similar soil and groundwater traits. Fractioning TPH is beneficial in the risk assessment process because certain fractions may be eliminated as contaminants of concern. Common petroleum-based chemicals encountered through company-related processes include:

- **Gasoline.** Gasoline is extracted from crude oil through a distillation process. It is comprised primarily of aliphatic hydrocarbons, but also includes some aromatic hydrocarbons such as benzene and toluene to increase octane ratings. Additional additives such as tetraethyl lead and methyl-tertiary butyl ether (MTBE) were added to gasoline to enhance performance and reduce harmful carbon monoxide exhaust emissions and reduce smog. Due its harmful effects to human health and the environment, neither additive is currently used and has been replaced instead with alcohols such as ethanol or methanol.

Gasoline is used primarily as a fuel source but can also be used as a solvent. Components of gasoline are considered to be carcinogenic, and because gasoline is highly volatile, inhalation of vapors is always a concern for workers. Gasoline is also a skin and eye irritant, its vapors are highly flammable, and it is a major source of pollution gas (i.e., 1 U.S. gallon of gasoline produces 19.4 pounds of carbon dioxide, a greenhouse gas). Gasoline is comprised of the following four constituents:

- Benzene – a colorless, flammable liquid with a sweet odor; makes up on average 0.62% to 1% of gasoline; is considered a known carcinogen with damaging effects to skin, eyes, respiratory system, blood, central nervous system and bone marrow, which can result in anemia (decreased red blood cell count making one weak and tired), decreased white blood cell count (difficult to fight off infections), and low blood platelet count (excessive bleeding); benzene causes damage through inhalation, skin absorption, ingestion and contact exposures; symptoms include: drowsiness, dizziness, headaches, confusion, tremors, skin/eye irritations, redness and blistering of the skin, vomiting, stomach irritation, convulsions, rapid heart rate, unconsciousness, leukemia (long-term) and death (large doses).
- Toluene – a colorless, flammable liquid with benzene-like odor (smells like paint thinner); can produce damaging effects to skin, eyes, respiratory and central nervous systems, liver and kidneys; toluene causes damage through inhalation, skin absorption, ingestion, and contact exposures; symptoms include: eye and nose irritation, weakness, exhaustion, confusion, euphoria, dizziness, headaches, dilated pupils, lacrimation (tears), anxiety, muscle fatigue, insomnia, parathesia (tingling or numbness of the skin), dermatitis, and liver/kidney damage.

- Ethylbenzene – a colorless, flammable liquid with aromatic odor (smells like gasoline); is considered a potential human carcinogen that can produce damaging effects to skin, eyes, respiratory and central nervous systems; ethylbenzene causes damage through inhalation, skin/eye contact and ingestion exposures; symptoms include: irritation of the eyes, skin and mucuous membranes, headaches, dizziness, dermatitis, narcosis (unconsciousness) and coma.
- Xylene – colorless, flammable liquid with sweet, balsam-like odor; is a mixture of ortho-, meta- and para-xylene isomers that releases carbon monoxide gas when burned; can produce damaging effects to skin, eyes, respiratory and central nervous systems, gastrointestinal tract, blood, liver and kidneys; xylene causes damage through inhalation, skin absorption, ingestion and skin/eye contact exposures; symptoms include: irritation of skin, eyes, nose and throat, dizziness, excitement, drowsiness, incoordination, staggering gait, corneal vacuolization, anorexia, nausea, vomiting, abdominal pain and dermatitis.

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Increase frequency of air monitoring once action limits are triggered to ensure that all ignition sources are removed or isolated when flammability limits are triggered. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

- **Kerosene.** Kerosene is a source of fuel refined from crude oil that is heavier than gasoline but lighter than diesel. It is a colorless to yellowish oily liquid used in households as a lamp oil and used industrially as jet fuel for aircraft and rocket engines. Kerosene has a strong odor, is highly flammable, and causes damage to the eyes, skin, respiratory system, and central nervous system. Workers may be exposed to liquid kerosene and its vapors through inhalation, ingestion, skin and/or eye contact. Symptoms include: irritation of eyes, skin, nose and throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; and chemical pneumonitis (aspiration liquid). Kerosene is commonly referred to as paraffin in other countries.

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Increase frequency of air monitoring once action limits are triggered to ensure that all ignition sources are removed or isolated when flammability limits are triggered. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

- **Diesel/polycyclic aromatic hydrocarbons (PAHs).** Diesel is a source of fuel refined from crude oil and used in diesel trucks, boats, school and city buses, trains, cranes, farming equipment, emergency response vehicles and power generators. Diesel is an attractive fuel source because it is less volatile and emits smaller amounts of greenhouse gases (CO and CO<sub>2</sub>); however, during combustion it does release large amounts of soot which can lead to acid rain, smog and poor health conditions. PAHs are found in crude oil and



soot and are also a by-product of petroleum processing or combustion, specifically the incomplete burning of oil and gas. Common PAH constituents include: acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)-fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene. The regulated PAH constituents are outlined below:

- Coal tar pitch volatiles - PAH components anthracene, benzo(a)pyrene, chrysene, phenanthrene, and pyrene, all of which have the same chemical description, target organs, and regulatory threshold limits are not addressed by NIOSH as individual components. Instead, they are classified and regulated as coal tar pitch volatiles. Coal tar pitch volatiles may vary slightly but are described as combustible, black or brown amorphous residues and are considered a potential human carcinogen with damaging effects to respiratory system, skin, bladder, and kidneys. Symptoms include: dermatitis and bronchitis.
- Naphthalene – Naphthalene is a combustible, colorless to brown solid with an odor or mothballs that causes damaging effects to eyes, skin, blood, liver, kidneys, and central nervous system. Symptoms include: eye irritation, headache, confusion, excitement, discomfort, nausea, vomiting, abdominal pain, bladder irritation, profuse sweating, jaundice, blood in urine, renal failure, dermatitis, optic and cornea damage.

*Control Measures:* Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Increase frequency of air monitoring once action limits are triggered to ensure that all ignition sources are removed or isolated when flammability limits are triggered. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

- **Hydraulic and lubrication oils.** Oils used for internal combustion engines to lubricate moving parts, prevent corrosion and to cool the engine. Lubricating oils are made from crude oil but also include additives to improve certain properties. Lubricating oils can be highly flammable and can cause irritation of nose, throat and lungs, headaches, dizziness, nausea, vomiting and diarrhea.

*Control Measures:* Avoid prolonged exposures to oil mist, liquid or vapor. Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

### 3.1.4.5 Pesticides

A pesticide is another type of organochlorine commonly used for crop dusting agricultural farmland not only to kill insects, rodents and germs, but is also used for weed and mildew control. The term “pesticide” includes a broad category of chemicals that can be further broken down into insecticides, rodenticides and fungicides. Some older and more recently banned pesticides (such as DDT) tend to be environmentally persistent. Workers are potentially exposed to

pesticides as part of the assessment or remediation of impacted farmland as well as commercial pesticide manufacturing and/or storage facilities. Similarly to chlorinated solvents, pesticides can be volatile making inhalation the primary route of worker exposures. However, workers may additionally be exposed to pesticides through ingestion, absorption and skin/eye contact. There are numerous pesticides tested as part of assessment and remediation of impacted sites; however, the following pesticides are OSHA-regulated materials that pose a potential health risk to workers:

- **Aldrin.** A noncombustible, colorless to dark-brown crystalline solid with mild chemical odor; may dissolve in flammable liquids; formerly used as an insecticide and is considered a potential carcinogen with damaging effects to the central nervous system, kidneys, liver, and skin; symptoms include: headache, dizziness, nausea, vomiting, vague feeling of discomfort, jerking of limbs, convulsions, coma, hematuria (blood in urine), and azotemia (blood containing high levels of urea, creatinine and other nitrogen-rich compounds).
- **Dichlorodiphenyltrichloroethane (DDT).** A combustible, colorless crystals or off-white powder with a slight aromatic odor; considered a potential carcinogen with damaging effects to the eyes, skin, central nervous system, liver, kidneys, and peripheral nervous system; symptoms include: skin and eye irritation, tingling and numbness of tongue, lips and face, tremor, anxiety, dizziness, confusion, vague feeling of discomfort, headache, weakness, exhaustion, convulsions, partial loss or impaired movement of hands, and vomiting.
- **Dieldrin.** A noncombustible, colorless to light-tan crystals with a mild chemical odor; used as an insecticide and is considered a potential carcinogen with damaging effects to the central nervous system, liver, kidneys, and skin; symptoms include: headache, dizziness, nausea, vomiting, vague feeling of discomfort, sweating, jerking of limbs, convulsions, and coma.
- **Endrin.** A noncombustible, colorless to tan, crystalline solid with a mild chemical odor; may dissolve in flammable liquids; used as an insecticide with damaging effects to the central nervous system and liver; symptoms include: epileptic-like convulsions, stupor, headache, dizziness, abdominal discomfort, nausea, vomiting, anorexia, insomnia, aggressiveness, confusion, drowsiness, weakness, and exhaustion.
- **Heptachlor.** A noncombustible, white to light-tan crystals with a camphor-like odor; may dissolve in flammable liquids; used as an insecticide and is considered a potential carcinogen with damaging effects to the central nervous system and liver; symptoms provided for animals only and include: tremor, convulsions, and liver damage.
- **Lindane.** A noncombustible, white to yellow crystalline powder with slight, musty odor; may dissolve in flammable liquids; causes damaging effects to skin, eyes, respiratory system, central nervous system, blood, liver, and kidneys; symptoms include: skin, eye, nose and throat irritation, headache, nausea, convulsions, respiratory difficulty, cyanosis, aplastic anemia, and muscle spasm.

***Control Measures:*** Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.



### 3.1.4.6 Polychlorinated Biphenyls (PCB)

Polychlorinated biphenyls (PCBs) are a mixture of numerous chlorinated compounds and are commercially sold under the trade name Aroclor® 1242 (contains 42% Cl<sup>-</sup>) and Aroclor® 1254 (contains 54% Cl<sup>-</sup>). It is a colorless to light-yellow, oily solid or liquid with no known taste or smell and can volatilize to a vapor with a slight increase in temperature. PCBs were used as coolants and lubricants in transformers, capacitors and electrical equipment because they do not burn easily and are good insulators. Production in the U.S. was discontinued in 1977 due to its environmental persistence and damaging health effects. PCBs do not easily break down, bind strongly to soil, accumulate in fish and marine life, and can travel far distances in air.

Workers are likely to be exposed to PCBs through damaged or burning transformers, known/suspected site contamination, or ingestion of contaminated fish. PCBs can also be found in pre-1977 fluorescent light fixtures, electrical devices (TVs and appliances), and hydraulic oils. Worker exposures are likely to occur through inhalation, absorption, ingestion and contact causing damaging effects to the skin, eyes, liver and reproductive system. Symptoms include: eye irritation, chloracne (acne-like skin condition in adults), liver damage, and reproductive effects.

*Control Measures:* Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

### 3.1.5 Other/Unknown Chemicals

#### 3.1.5.1 Activated Carbon

Also referred to as activated charcoal, this material comes in various forms but is most often purchased by PPM in granular form (occasionally purchased in pellet form). Activated carbon is a porous material that is effective in the adsorption of gases/vapors and is commonly used as part of the groundwater treatment process. This material is non-toxic but can be irritating to the skin and eyes. Loose granules can also present a slip hazard and dusts can accumulate when replacing spent carbon with unspent carbon.

*Control Measures:* Keep granules inside storage bag or carbon vessel and immediately remove spilled granules from the work area to prevent slipping. Wear appropriate protective clothing such as gloves and safety glasses when working with/near this material to prevent skin and eye contact. Keep dust generation to a minimum using a porta vac and be prepared to wear a dust mask or half mask with P-100 HEPA cartridge when dusts cannot otherwise be mitigated.

#### 3.1.5.2 Alconox®/Liquinox®

Alconox® (powder) and Liquinox® (liquid) are detergents used to decontaminate bailers and equipment to prevent cross-contamination of samples. Detergents generally can be skin or eye irritants that can cause itching, pain, redness or burning.

*Control Measures:* Keep face away from solution when mixing and wear safety glasses with side-shield protection or goggles depending upon the degree of splashing. Wear hand protection when handling this product and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

### 3.1.5.3 Descaling Agents (Analytix AN-754GH)

Various chemicals may be used to prevent the accumulations of scaling along monitoring well walls. These descalers may vary by office location; however, most of these chemicals exhibit similar characteristics. They are typically acidic in nature and may be extremely corrosive to skin, eyes, and respiratory system.

*Control Measures:* Keep face away from solution when handling and wear safety glasses with side-shield protection or goggles depending upon the degree of splashing. Use safe precautions when handling material and make every effort to avoid direct contact with this material through the use of protective clothing and equipment such as chemical-resistant gloves, goggles and aprons. Avoid inhaling any fumes that may arise from these chemicals.

### 3.1.5.4 GoJo® Natural Orange™ Pumice Hand Cleaner

GoJo® Natural Orange™ is a nonhazardous sanitizer used to clean hands, face, and exposed skin from dust, sludge, or other residues that may be encountered through the inspection process. This cleaning agent is not likely to produce adverse effects for most workers; however, some may be sensitive to this substance and reactions can consist of skin and eye irritations that can cause itching, pain, redness or burning.

*Control Measures:* Keep cleaning agents away from eyes and avoid continued use if you experience adverse skin reactions. If reactions persist after the substance is discontinued and cleaned from the affected area, seek prompt medical attention.

### 3.1.5.5 Magnaflux Soundclear® Gr. 60

Magnaflux Soundclear® Gr. 60 is an ultrasonic couplant (a bonding gel) that is applied to the transducer of the ultrasonic thickness meter, which when applied to the exterior wall of storage tanks, can establish the thickness of the tank wall.

*Control Measures:* Keep gel away from eyes and skin, and avoid continued use if you experience adverse eye/skin reactions. If reactions persist after the substance is discontinued and cleaned from the affected area, seek prompt medical attention. Use appropriate sanitation precautions to avoid accidental ingestion. Inhalation is not anticipated; however, respiratory irritations may occur if not handled properly.

### 3.1.5.6 Unknown Chemicals and/or Concentrations

Workers do not often come into contact with unknown chemicals and/or chemical concentrations. Although rare, workers may potentially encounter unknowns during drum characterizations as requested by a particular client. When the client cannot identify the material(s) inside a drum or other container, this material(s) is to be treated as an extremely hazardous substance using the highest level of safety precautions including, but not limited to, personal protective clothing/equipment. When working with known chemicals at unknown concentrations, the same level of safety precautions must be implemented to preserve worker safety and wellbeing. These situations are considered an immediately dangerous to life and/or health (IDLH) environment.

*Control Measures:* When this type of work is proposed by a client, it must be presented and approved by Authorizing Principals, Shawn Ivey or Zane Hood. Due to the increase in safety precautions, a site-specific HASP must be generated by the HSD, which may require additional time to prepare. Never open a drum/container that does not belong to PPM if the contents or concentrations are unknown.



# HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

## HEALTH AND SAFETY PLAN

### 3.1.6 Chemical/Physical Properties

The following table outlines the chemical and physical properties associated with the most common volatile or semi-volatile constituents encountered by PPM.

Chemical Name	VP <sup>1</sup>	VD <sup>2</sup>	SG <sup>3</sup>	Sol <sup>4</sup>	FP <sup>5</sup>	LEL <sup>6</sup>	UEL <sup>7</sup>
Diesel	0.009 psia	>1	0.83-0.88	Negligible	125	0.6	7.5
Gasoline	38-300	3-4	0.72-0.76	Insoluble	45	1.4	7.6
Benzene	75	2.8	0.88	<1	12	1.2	7.8
Toluene	21	4	0.87	<1	40	1.1	7.1
Ethylbenzene	7	4	0.87	<1	55	0.8	6.7
Xylene	9	4	0.86	<1	81	1.1	7.0
MTBE	245-256	3.1	0.74	4.8	-17	1.6	8.4
Ozone	>1 atm	1.7	2.14	<1	N/A	N/A	N/A

1 – Vapor Pressure (mmHg) – the higher the VP, the more likely it is to change from a liquid to a vapor with an increase in temperature.

2 – Vapor Density – how heavy the material is in air; anything >1 will sink into worker breathing zone; anything <1 will rise.

3 – Specific Gravity – how heavy the material is in water; anything >1 will sink in water; anything <1 will float on water.

4 – Solubility (%) – how likely the material is to be dissolved in water.

5 – Flash Point (°F) – lowest temp that material vapors will ignite/burn.

6 – Lower Explosive Limit (%) – lowest concentration in which vapors will ignite.

7 – Upper Explosive Limit (%) – highest concentration in which vapors will ignite.

### 3.2 PHYSICAL HAZARDS AND CONTROLS

#### 3.2.1 Combustion/Flammability

The three elements needed to produce a fire are: combustible material, oxygen, and ignition source (heat). As part of most projects, the presence of gasoline (flammable contaminant) within an outdoor environment (sufficient oxygen content) when combined with the use of heavy equipment (electrical source) provides all three elements necessary to produce a flammable setting. Fires can also be the result of overloading circuitry and improper chemical storage.

**Control Measures:** Monitor ambient site concentrations to ensure flammable action limits are not triggered. Oxidizers are capable of releasing oxygen and generating heat so store them away from combustible materials. Do not overload power outlets. Remove foot heaters or other electrical devices if they trip ground fault circuit interrupters (GFCI) or produce burnt smell and/or smoke. Use ABC-rated fire extinguisher to extinguish fire or follow company evacuation procedures when warranted.

#### 3.2.2 Compressed Gas

Compressed gases such as acetylene and oxygen may be used to operate cutting torches. Cylinders can become projectiles if they are not secured and/or stored properly. Improper handling of cylinders can also result in muscular sprains/strains, falls, bruising, or broken bones. Other hazards may include chemical burns, explosion fire, poisoning, and cold burns due to container mishandling. In addition, utility gas lines are often buried onsite nearby areas where drilling, trenching or other similar surface disturbances are likely to occur. Contact with a subsurface gas line could result in an explosion, fire, and other significant physical bodily injury.

**Control Measures:** Only qualified workers appropriately trained in compressed gas safety are permitted to work with compressed gases. Keep compressed gas cylinders upright and secured when in storage, transit or use. The valve protection cap must remain in place when not in use and during storage and should only be removed when the cylinder is secured and/or ready for use. Never drag or slide a compressed gas cylinder, drop a cylinder, or subject cylinders to strikes from other objects as this may cause damage to the valves. Store in a climate-controlled environment away from heat sources, heavily traveled paths, and emergency exits and store

other combustible materials in a separate location away from compressed gas cylinders. Smoking is prohibited near compressed gases. Keep empty and full cylinders segregated and replace empty cylinders promptly. Restrict unauthorized access to compressed gases and visually inspect containers weekly.

### 3.2.3 Concrete Coring and Cutting

The use of jackhammers and coring equipment is necessary to cut through concrete when conducting subsurface work. The use of this equipment is extremely loud, creates dusty environments and can create projectiles out of broken pieces of concrete.

*Control Measures:* Wet affected areas of concrete to reduce amount of dust generated; however, avoid creating large puddles of water as some equipment being used is corded and can create electrical hazards. If dust continues to be a problem, workers must wear air-purifying respirator with P-100 HEPA filter. Use vacuum-based core drills or secure the base of the core drill to concrete when working on uneven surfaces. Know where the manual shut-off switch is located and if not within reaching distance of worker, someone must be present at electrical outlet to unplug equipment should it be necessary. Operator and any worker required to be within 10 feet of coring/cutting process must wear face shield over safety glasses with side-shield protection to protect against flying particles.

### 3.2.4 Contaminated Water/Splash Hazards

Beware of splash hazards posed by purging and/or development of groundwater monitoring wells. Chemical splash hazards may also be encountered during drum sampling of known contaminants. Contaminants are likely to vary; therefore, the chemical hazards section of this plan should be referenced to address the hazards posed by the contaminant.

*Control Measures:* Workers must wear safety glasses with side-shield protection. Goggles may be necessary depending upon the degree of splashing. Goggles are required when moving containers of or working with severe eye irritants, acids or caustics.

### 3.2.5 Cuts and Lacerations

Acetate liners used for soil collections must be cut to collect the sample. Also, tubing materials used when groundwater sampling or used for air monitoring must be cut in various lengths. Shears or tube cutters are alternatives to using knives or other blades; however, there may be instances in which the use of knives or blades cannot be avoided.

*Control Measures:* Always use sharpened blades as dull blades can require more applied force. Wear leather or Kevlar® gloves to protect hands. Secure the object being cut keeping free hand out of the way and always cut away from the body. If cut must be made towards the body, cut the object at an angle away from the body. Utility knives must have a self-retracting blade and should not be stored in pockets of clothing.

When collecting soil samples, workers should rely upon the subcontractor to cut the sample liners whenever possible. When workers must cut the liners, the following specific instructions are required:

- Secure the liner to a stable structure (i.e., the truck tailgate or portable table).





- Use the proper cutting tool for the job (see photo); subcontractors often have this tool.
- Cut the liner perpendicular to the body – avoid cutting towards the body.

### 3.2.6 Driving Safety

Most company-related field activities occur offsite and require personnel to drive from the office to the jobsite. Collision with another vehicle or into a structure can result in property damage, worker injury or even a fatality.

Control Measures: Drivers must have valid state license to drive and must be classified appropriate to the type of vehicle he/she will be required to operate (i.e., vehicles with gross vehicle weight rating [GVWR] >10,000 lbs or any vehicle/trailer combination GVWR >10,000 lbs requires a commercial driver's license). Additional safety precautions for driver safety include, but are not limited to, the following:

- Obey all federal and state traffic laws (i.e., speed limits, yielding, etc.)
- Plan route to site in advance to avoid traffic congestion, construction, road closures, inclement weather or other similar forms of delay
- Perform pre-use inspection to ensure vehicle is fueled and in good working order
- Ensure all materials are secured
- Avoid distractions such as changing radio stations, reading texts or emails, eating, drinking, or other similar functions
- Pull over to take or make a phone call even when using hands-free devices
- Texting while driving is strictly prohibited by PPM and is a law in several states
- Drive defensively - yield to aggressive drivers, slow down when driving through adverse weather conditions or when driving through school zones

### 3.2.7 Drowning

Water bodies where the potential for drowning exists includes: oceans, rivers, lakes, seas, gulfs, bays, ponds, wetlands, bayous, streams or other similar water sources. Work over or near these types of water bodies is rarely encountered, and routine company job tasks do not usually result in the use of a boat. However, when they arise, jobs of this nature do pose a risk of drowning. When sample collections are anticipated to occur from within a boat, this will likely take place in various locations of the water body with varying or unknown depths, currents, floating and subsurface debris, and/or other similar hazards.

Control Measures: Tasks requiring work over or near water where the potential for drowning could occur requires a minimum of two workers. Use a boat with a flat, stable surface to reduce the potential for rollover. In addition, workers must wear a U.S. Coast Guard-approved life preserver at all times when inside the boat or when otherwise performing a task where the potential for drowning still exists. Once over water, movement within the boat should be minimized, and workers must use caution when collecting the sample. Workers must be equipped with buoys or other similar means to extract any individual that should fall into the water.

### 3.2.8 Electrical

#### 3.2.8.1 Subsurface and Overhead Utilities

Typical jobsites will pose both subsurface and overhead utility hazards. Also, remediation systems are electrically operated and pose similar electrical hazards. Contact with power lines or exposed electrical wires can result in electric shock, severe skin burns and electrocution. Electrical wires are generally insulated as a first line of defense; however, tears or damage to the insulated material can directly expose workers to the wire. Other utility lines may be present at common jobsites and include water, sewer, natural gas, telephone and fiber optic. A punctured

natural gas line can spontaneously combust and cause a massive explosion. In addition, active retail gas stations contain subsurface product lines running from the tank pit to the dispenser islands and the layout of these lines can often be difficult to determine. Damage to some utilities may not necessarily pose a safety risk but damage to these structures can disrupt normal business functions and be very costly.

*Control Measures:* Treat all electrical lines and wires as active and avoid contact. Keep all equipment at least 10 feet away from all overhead power lines unless they have been isolated or shielded by the local energy company. Add an additional 0.4 inches to this distance for every 1 kV in excess of 50 kV. Follow all clearance procedures outlined within the company's written Subsurface Clearance program, which includes but is not limited to the following measures:

### Pre-Work Clearance (Offsite and Onsite Preparations)

- Request as-built drawings and/or obtain specialized knowledge of subsurface utility/structural locations from the client or property owner.
- Pre-plan borehole locations and visually review with client or property owner.
- Contact state one-call 48-72 hours (state-specific time requirements vary) to mark utility locations prior to field work; make secondary notices if site not marked.
- Contact additional local utility providers that do not subscribe to one-call to mark utility locations prior to field work; make secondary notices if site not marked.
- Hire private utility locators to identify presence of subsurface structures in addition to or in the absence of other clearance methods.
- Perform visual site observations for indicators of subsurface utilities/structures.
- Locate all emergency shut-off devices and isolate the work area.
- Identify and avoid critical zones (*any area within 10 feet of UST system*) or obtain principal approval when there are no other alternatives to avoidance.
- Follow clearance procedures for critical and non-critical zones.

### Subsurface Clearance Procedures

- Clear all boreholes horizontally to 110% of the diameter of the widest digging instrument intended for use starting in all four cardinal directions (NSEW) then fully covering the entire circumference of the area.
- Clear all boreholes vertically to minimum 4-foot depth BGS unless greater depths are specified by the Office Manager/Principal.
- Use company-approved clearance methods (for drilling/probing) in order of preference outlined as follows:
  - 1) Blunt-tip push probe
  - 2) Tiered approach – use push probe for vertical clearance, then use digging tools (i.e., hand auger or post-hole diggers) to clear horizontally to same depth previously cleared vertically; then use push probe to further advance vertically; continue until depth-requirement is achieved
  - 3) Hand auger and/or post-hole digger – used only when push probe cannot otherwise be advanced vertically due to soil type(s)
- Use flat-edge shovel to clear for trenches/excavations when in areas of marked or suspected subsurface utilities/structures; clear area until utility/structure is located; if not located within depth-requirement, proceed with trenching/excavating.

### 3.2.8.2 Electrical Tools and Power Cords

Assorted power tools may be required for certain tasks. Power tools can be battery operated or otherwise have an electrical power cord, which can be plugged into an electrical outlet. Due to this factor, energy can be controlled by plugging or unplugging the cord and does not require energy isolation. The electrical wires are typically insulated; however, kinks or cuts made to the



power cord jacket can expose workers to these electrical wires resulting in electric shock or electrocution.

*Control Measures:* Perform an initial inspection to ensure tools and cords are in good working order and immediately discard or label damaged tools/cords to prevent use until repairs or replacements can be made. Additional safety precautions for electrical protection include, but are not limited to, the following:

- Only use electrical outlets and matching cords with grounding wire (3-prong).
- Never remove grounding prong to accommodate a 2-prong electrical outlet.
- Electrical cords should be rated for hard or extra hard use.
- Insulated jackets should show no evidence of kinks, cuts or tears; any sign of wear (frayed insulation or exposed wires) requires immediate labeling of the cord as “damaged” and must be immediately removed from the work area.
- Avoid placing electrical cords or tools in pools of water or other wet areas.
- All portable or temporary wiring must be protected by GFCI.
- Avoid using tools or cords that trip the GFCI.
- Do not run over cords or place them through doors, windows or other pinch points.

### 3.2.8.3 Lockout/Tagout

Remediation systems are electrically-operated systems that may require energy isolation as part of operation, maintenance or repairs. According to 29 CFR 1910.147(a)(2)(ii), energy must be isolated when 1) a worker must remove or by-pass safety guards or devices; or 2) a worker must place a body part at the point of operation or where a danger zone exists in the operating cycle. These requirements do not apply to corded equipment as this power source can be isolated by unplugging the equipment. It also does not apply to other pressurized systems for gas or steam if it can be proven that continuity of service is essential or that shut down of the system is impractical.

Routine operations and maintenance procedures typically do not trigger the requirements for energy isolation. However, it should be noted that during certain system or component repairs, these criteria may be triggered and the locking and tagging of the system and/or its components is necessary to prevent the unintentional startup of the system.

*Control Measures:* Locking and tagging of the system must be conducted in accordance with company requirements outlined within its written Lockout/Tagout program. An itemized procedure list for system deactivation and reactivation are posted at all remediation systems.

### 3.2.9 Hand and Power Tools

The electrical hazards posed by the use of power tools have previously been addressed. However, other hazards are posed by the use of hand or power tools. Removing or by-passing safety guards can expose a worker to the piercing, cutting, crushing or rotating hazards of mechanical equipment. Improper posture or repetition of hand tools can lead to musculoskeletal disorders as outlined within the previous section.

*Control Measures:* Use equipment in accordance with manufacturer guidelines and according to its intended purpose. Always select the appropriate tool for the job and refrain from making adjustments. Never remove or bypass safety guards. Perform an initial inspection to ensure tools are in good working order and immediately discard or label damaged tools to prevent use until repairs or replacements can be made. Keep tools stored appropriately to prevent rust or other signs of weathering. Wear appropriate head, eye, hand, and foot protection at all times. Avoid wearing jewelry or loose-fitting protective gloves/clothing that could become entangled in moving parts of the tool.

### 3.2.10 Illumination

Most company-related tasks will be conducted during normal, daylight hours; however, some tasks may be required to be conducted at night. When these instances occur, visibility will be decreased making the jobsite and the task more dangerous. In addition, the overall visibility of workers to drivers, equipment operators, etc. may be decreased.

Control Measures: The National Cooperative Highway Research Program (NCHRP) Report 498: Illumination Guidelines for Nighttime Highway Work outlines a set of guidelines for adequate lighting when working at night. Workers should adhere to these requirements to ensure appropriate visibility during all phases of the project. The three categories outlined by the NCHRP include the following:

- Level I illuminance is necessary in areas where the work crew is in motion, moving from spot to spot. Required for low accuracy tasks that may involve the use of slow-moving equipment, and where large objects must be visible.
- Level II illuminance is necessary in areas on or around construction equipment. A higher degree of lighting in this area will provide a safer environment for equipment operators allowing them to perform tasks that require a moderate level of accuracy.
- Level III illuminance is necessary for tasks that require a higher level of visual acuity or difficulty.

Sample tasks and the illumination requirements for those tasks are outlined below:

Sample Tasks (Not All-Inclusive)	Illumination Levels	Average Minimum Maintained Illuminance
All work operation areas; setup of lane or road closures, lane closure tapes, and flagging stations	Level I	54 lux (5 foot-candles)
Areas on or around construction equipment; asphalt paving, milling and concrete placement and/or removal	Level II	108 lux (10 foot-candles)
Pavement or structural crack/ pothole filling; joint repair, pavement patching/repairs; installation of signal/electrical/ mechanical equipment	Level III	215 lux (20 foot-candles)

*Note: A foot-candle (fc) is defined as a unit of illumination that is equal to one lumen per square foot, or 10.764 lux.*

Increased lighting can be provided using portable light plant towers, balloon lighting, roadway luminaires mounted on temporary poles, and factory-installed lights on equipment. Workers should select a light source and position it in a manner that reduces the amount of glare. When conducting night tasks on or near road system right-of-ways, workers must additionally adhere to appropriate state DOT roadway and traffic control requirements. Reflective clothing/vests are required when working at night or decreased illumination.

### 3.2.11 Ladder Safety

#### 3.2.11.1 Portable Ladder Safety

Portable ladders are commonly used when replacing spent carbon with inactivated granular carbon or to access stationary aboveground storage tanks for inspections and/or maintenance. Carbon vessels consist of 55-gallon drums or other vessels that commonly range from 8-30 feet in height. It should be noted that carbon vessels can exceed 30 feet but these vessels are not common to current company processes. As part of this change-out process, workers must climb

portable ladders at heights greater than 4 feet and they must do so carrying 50-lb sacks of granular carbon or other materials.

*Control Measures:* Falls from ladder use are exempted from the fall protection standards (29 CFR 1926.500-503). Instead falls from ladders are outlined within 29 CFR 1910.23, which does not require the use of personal fall arrest system when working at elevations in excess of 4 feet (general industry). Use buddy system when able or check in periodically with the office to relay status. Use a portable A-frame ladder and ensure that it is locked in place. Place ladder on level, compact ground surfaces and avoid wet areas. Never place ladder near entrance/exit or other pathway that could interfere with ladder usage. Use ladder for its intended purpose and in accordance with manufacturer's guidelines. Use two hands when ascending or descending.

### 3.2.11.2 Fixed Ladder Safety

Fixed ladders may be used at client facilities to access rooftops or other similar elevated walking/working surface. This is often necessary with asbestos and/or lead sample collections, vacuum events, aboveground tank inspections and industrial compliance.

*Control Measures:* Falls from ladder use are exempted from the fall protection standards (29 CFR 1926.500-503). Instead falls from ladders are outlined within 29 CFR 1910.23, which does not require the use of personal fall arrest system when working at elevations in excess of 4 feet (general industry). According to OSHA requirements, fixed ladders must have cages, wells, ladder safety devices, or self-retracting lifelines when the climb is less than 24 feet but the top of the ladder is greater than 24 feet above lower levels. When a fixed ladder is greater than 24 feet, it must be equipped with one of the following: ladder safety devices or self-retracting lifelines with rest platforms at intervals not to exceed 150 feet. When able and it does not otherwise introduce additional safety hazards, personnel may be required to use personal fall arrest system. This will be determined on a case-by-case basis.

### 3.2.12 Material Handling and Back Safety

It is common for workers to transport materials such as hand or power tools, bailers, sampling containers and monitoring equipment from the office to various site locations. Workers are also likely to relocate drums or other chemical storage containers. Materials may be heavy putting strain on the back, or they may be large or bulky and obstruct vision during transport.

*Control Measures:* When lifting or relocating heavy or large items, mechanical devices should be used as a first line of defense. When mechanical means are not available, workers should use the buddy system to lift and transport loads in excess of 50 lbs or load that obstruct view of travel. When lifting an object, workers should bend at the knees and lift with the legs – avoid applied pressure to the back as muscle strain will likely occur. Keep loads close to the body and avoid twisting while carrying loads. Ensure travel paths are free of obstructions prior to lift and relocating materials.

### 3.2.13 Mobile Equipment

#### 3.2.13.1 Heavy Equipment and Machinery

Various types of heavy equipment are necessary to perform routine tasks such as drilling, geoprobing (direct push), mobile vacuum, trenching, excavating, remediation system installations and removals, underground storage tank removals, and other similar tasks. The use of this type of equipment is mostly subcontracted, and PPM requires its subcontractors be adequately trained to safely operate these types of heavy machinery. Other forms of heavy equipment such as forklifts, skid steers, and core drills can be operated by company personnel. PPM requires that operators of these types of equipment be deemed competent by the company through safety, instructional and observational training and/or operator experience. Also,

equipment must be inspected by a competent prior to use, documented and returned to the safety department for recordkeeping. Hazards associated with the use of heavy equipment include, but are not limited to, the following:

- Pinching, rolling, crushing, rotating hazards from equipment, hoses and connections
- Contact with overhead or underground utilities gas lines, power lines, etc.)
- Falling loads
- Hydraulic or pressurized equipment parts
- Swing radius of equipment
- Operator blind spots
- Hot equipment parts



**Control Measures:** Use equipment in accordance with its intended purpose. Machinery must be grounded prior to use and equipped with emergency stop devices. Workers must locate and test these devices prior to using the equipment. When the equipment is in use, one worker must be readily available to engage emergency stop devices unless other workers remain away from the equipment while in operation. Equipment must remain at least 10 feet away from any overhead utility line unless the line has been otherwise isolated or shielded from accidental contact. Derricks/masts of mobile equipment must be lowered prior to relocating equipment from one location to another while onsite. Personnel who work with or near rotating or other moving parts are prohibited from wearing jewelry, loose clothing or other similar means that could become entangled within the equipment. Long hair should be tied back and protective clothing should fit securely. Workers should not collect samples or otherwise place hands in or near augers when it is rotating, and workers must also avoid climbing mast of equipment when it is in operation. Wheels should be chocked and hand brakes set to secure equipment when at rest.

Contact with hot parts must be avoided and it should be noted that metal parts become extremely hot with sun exposure, which can cause significant skin burns. Workers are prohibited from working beneath elevated loads and must avoid any area impacted by the swing radius of operating equipment unless a spotter is used. Additionally, workers must be aware of operator blind spots which may also require the use of a spotter.

### 3.2.13.2 Aerial and Scissor Lifts

Use of aerial and/or scissor lifts is a rare occurrence. Workers anticipated to use such equipment will require additional training beyond what is provided through policy/procedural safety orientation(s) and annual refresher. Aerial and scissor lifts are not synonymous and are covered under two separate OSHA regulations. Regulatory requirements for aerial lifts can be found in §1926.453, while requirements for scissor lifts (defined by OSHA as a mobile scaffolding system) can be found in §1926.452(w). This equipment can reach elevations in excess of 4 feet triggering fall protection. It should be noted that per OSHA guidelines, aerial lifts require the use of personal fall arrest systems in conjunction with the use of a guardrail system, while scissor lifts require the use of personal fall arrest systems only in the absence of a guardrail system.

**Control Measures:** Use of aerial and scissor lifts is strictly prohibited unless approved in advance by the safety department. Additional regulatory training and competency assessment(s) will be required in making this determination.

### 3.2.14 Noise

OSHA regulates worker exposures to noise. The established action limit for an 8-hour workday is 85 decibels (dB), a time-weighted average (TWA). Levels at or in excess of this limit can cause hearing loss, which depending upon exposure can be a temporary or permanent loss. Noisy



environments can also interfere with worker communication and comprehension, which poses additional safety risks.

Noise exposures can be measured using sound level meters or noise dosimeters. Certain work-related processes considered to be noisy include but are not limited to the following:

- Remediation systems – systems vary, but noise levels have been measured  $\geq 90$  dB
- Heavy equipment operation (including vac trucks) – have been measured  $\geq 120$  dB
- Use of power tools – sound levels vary (electric drill – 95 dB, power saw 110 dB, power drill – 130 dB, pneumatic drill – 120 dB)
- Work conducted nearby high traffic roadways – typical freeway traffic is 70 dB; however, large 18-wheelers have been measured  $\geq 90$  dB
- Coring and cutting of concrete – use of jackhammers or coring equipment have been measured  $\geq 130$  dB

*Control Measures:* Download NIOSH Sound Level Meter or similar app on any smart phone to assess noise levels. Sound level meters may also be used to assess noise levels. Document noise levels using PPM's Occupational Noise Monitoring Report and return to the HSD upon completion of the project. In the absence of monitoring equipment, workers who must shout at a co-worker 5 feet away are likely triggering regulatory threshold limits for noise exposures. Those environments  $\geq 85$  dB require the use of administrative controls or protective equipment. Administrative measures such as limiting work hours within noisy environments should be the first line of defense used to control worker exposures to noise levels in excess of 85 dB. When this cannot be achieved use hearing protectors such as earplugs, canal caps or ear muffs to protect worker hearing.

### 3.2.15 Repetitive Motion

Some tasks require a degree of repetition that may put strain on muscles and joints of the body. Poor posture can also put a similar degree of strain on the body. Typical symptoms of repetitive motion strain do not necessarily occur immediately (i.e., they can appear at rest during sleep) and include but are not limited to the following:

- Tingling, swelling or numbness of wrists, knees, elbow or other joints
- Sharp, piercing pain
- Loss of flexibility or muscle strength

*Control Measures:* Avoid performing repetitive tasks that target specific parts of the body for extended periods of time. Recognize symptoms promptly and vary job task for a while. Stretching and flexibility exercises can strengthen muscles over time. Report any signs or symptoms of repetitive motion strain to the HSD immediately. These injuries progressively worsen so prevention is imperative.

### 3.2.16 Scaffolding

Use of scaffolding systems, which includes walking, working, assembling, disassembling, and/or other similar uses, is a rare occurrence. Workers anticipated to work on or near scaffolding systems will require additional training beyond what is provided through policy/procedural safety orientation(s) and annual refresher. Scaffolding systems will most commonly be encountered at a client facility and should be avoided.

*Control Measures:* Use of scaffolding systems is strictly prohibited. Work requiring the use of a scaffolding system will be subcontracted to appropriately qualified contractors.

### 3.2.17 Slips, Trips, and Falls

Open boreholes generated through drilling or direct push as well as improper materials storage can pose tripping hazards. In addition, typical groundwater monitoring activities can result in open monitoring wells producing the same results. Trenching and excavating jobs can result in large, open earth depressions of varied depths and widths in which workers, tools or equipment could potentially fall. Activated carbon replacements, asbestos/lead sampling, aboveground storage tank inspections and/or maintenance, and use of catwalks may require work at elevations  $\geq 4$  feet, which may require additional safety measures such as the use of fall protective equipment (i.e. full-body harness and lanyard). *Note: Only personnel who have received additional fall protection training are considered competent for performing these tasks – all other workers are prohibited from working at elevations  $\geq 4$  feet without additional training and certification.*

Areas surrounding tank systems are likely to contain aboveground piping, pumps, loading platforms, retaining walls/berms, and other similar features which may require the worker to walk on and/or over in order to gain access to certain areas of the tank for inspection. Walking on or around surfaces associated with drainage structures (i.e., sumps, canal ditches, etc.) may also create slip, trip and fall hazards.

*Control Measures:* Store all materials away from work areas until ready for use and keep all travel paths unobstructed. Walk around materials – never walk over them. Use secured, steel sheet plates or wood to cover open boreholes. Use company truck and cones to isolate traffic from open monitoring wells. Heavy equipment, barricades and caution tape must be used to isolate open excavations from vehicular traffic and unauthorized personnel. Use full-body harness and lanyard to tie-off to stable structure when working on walking/working surfaces at elevations  $\geq 4$  feet (refer to Section 3.2.19). Refer to Section 3.2.11 for fall hazards associated with the use of ladders.

### 3.2.18 Traffic and Secluded Areas

Most petroleum remediation activities occur at active retail gasoline facilities, which expose workers to vehicular traffic. In some cases, work may be required within roadway right-of-ways or workers may be required to cross highways to perform work on an adjoining property or within a median. Secluded areas are not typical of most field-related projects; however, they do exist on occasion. Workers required to perform tasks at remote locations should be aware that these locations may be unlawfully inhabited and/or have the potential for illegal activities.

*Control Measures:* Use buddy system when working in high traffic areas as first line of defense, especially on spill bucket closures, groundwater sampling, or other similar tasks that require workers to bend, kneel or sit at or slightly above ground level which greatly decreases worker visibility. When these conditions are triggered, the buddy system will require one worker to stand nearby the other worker to create a unit whereby the observer has the primary responsibility of ensuring the safety of the worker with decreased visibility. When working upright, the buddy system will permit workers to separate only to distances that are clearly visible to both workers in a manner that ensures both can continuously monitor the other during all phases of the task. For example, during the sample collection, workers must fill vials or other containers at the vehicle so that they remain in an upright position during collection. Collections at the well are prohibited unless workers are together as a unit because when workers are separated, this process generally requires the worker to bend or kneel, which decreases the visibility of that individual. In addition, the worker is no longer in a position to observe his/her co-worker voiding the effectiveness of the buddy system. If operating as a unit, one worker may observe while the other collects the sample at the well.



When the buddy system cannot be implemented, use the company vehicle and cones to clearly define and block traffic from your work area. Relocate vehicle and cones when work area changes. Workers must wear high visibility safety shirts or ANSI Class II vests to increase visibility even when using additional safety precautions. Reflective clothing/vests are required when working at night or decreased illumination. Additional illumination requirements for night work can be found in Section 3.2.10. When conducting night tasks on or near road system right-of-ways, workers must additionally adhere to appropriate state DOT roadway and traffic control requirements. When working in secluded or unsafe areas, the following measures are required:

- Schedule work during daylight hours.
- Contact local police department and inquire about security.
- Never go to site alone; use buddy system.
- Notify manager or co-worker regarding your location, estimated time to perform duties and anticipated time of return; make intermittent calls throughout the day.
- Have cell phone readily available and pre-set to 911.
- Carry whistle and pepper spray as alternate methods of defense.
- Wear work clothes and protective equipment to identify you are there in a professional capacity.
- Park vehicle nearby and never exit the vehicle if anyone or anything appears suspicious.

*Note: The use of the buddy system as outlined above applies to traffic hazards only and should not be incorporated universally without additional discussion and management approval. For instance, the use of the buddy system as required when conducting emergency response is clearly specified by OSHA §1910.120 in a manner that opposes the previously outlined requirements. In the absence of regulatory direction, PPM will adhere to this definition of the buddy system.*

### 3.2.19 Walking/Working Surfaces

#### 3.2.19.1 Elevated Walking/Working Surfaces

Activated carbon replacements, asbestos/lead sampling, and aboveground storage tank inspections and/or maintenance may require work at elevations  $\geq 4$  feet. In addition, use of catwalks may exist at heights  $\geq 4$  feet. According to §1910.21, a catwalk is considered a runway which is defined as a passageway for persons, elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings. When working on multilevel surfaces, any floor deteriorations or openings must be obstructed to prevent inadvertent falls from an elevated surface. Also, when working on multilevel structures, such as the roof of a tank, openings within the walking/working surface can cause collapse and/or extreme falls. Working at elevated heights can create fall hazards that can result in a fatality or serious physical impairment. Due to these risks, tasks such as these may require additional safety measures such as the use of fall protective equipment (i.e. full-body harness and lanyard). Falling objects from a catwalk to a lower level is another hazard commonly associated with elevated walking/working surfaces. *Note: Only personnel who have received additional fall protection training are considered competent for performing these tasks - all other workers are prohibited from working at elevations  $\geq 4$  feet without additional training and certification.*

*Control Measures:* Walking/working surfaces located greater than 4 feet (general industry) above ground surface requires fall protection in the form of a guardrail system to protect against inadvertent falls from elevated heights. Use barriers to isolate floor openings to prevent inadvertent trips and/or falls through such openings. Holes and openings must always be covered when not otherwise needed to perform a task. To protect workers from falling objects, runways must include toeboards, screens, guardrail system, debris nets, catch platforms, canopy structures, or barricades. Workers on lower levels must also wear hard hats at all times. Runways should consist of a nonskid surface material or grating, handrail supports for 200 pounds of force,

and means of egress that is permanent and stationary (ex. fixed ladders or stairs). Workers should wear laced footwear with rubber soles to give better foot and ankle support and to reduce the likelihood of slips.

### 3.2.19.2 Uneven Walking/Working Surfaces

Uneven walking and/or working surfaces are not uncommon. Sites with minimal grounds-keeping can disguise potholes, which could result in trips/falls or foot injuries. Dense vegetation can also disguise dips and potholes. Using limbs, branches, or other similar debris to cross over streams creates an unstable ground surface that can become structurally unsafe after repeated use. Aboveground storage tank lids may be domed and unlevel posing additional hazards in the inspection process.

Control Measures: When work is to be performed at an inactive facility, bring weed eaters and sprayer to address overgrown vegetation. When grounds keeping is the responsibility of the client, the Project Manager should call in advance and request site maintenance be performed prior to PPM's arrival onsite. Workers should also wear laced, steel-toed boots which gives better ankle support than slip-on safety footwear. When working in highly vegetative areas that must be accessed, workers should use mechanical equipment to clear cut access paths or use other hand tools. Avoid walking over vegetation or other debris that may become unstable after repeated use.

### 3.2.19.3 Unstable Soils and Cave-Ins

Soil is an extremely heavy material, and may weigh more than 100 pounds per cubic foot. A cubic yard of soil may weigh more than 2,700 pounds. That is nearly one and a half tons, the equivalent weight of a car. Furthermore, wet soil or rocky soil is usually heavier. The human body cannot support such heavy loads without being injured. The primary hazard associated with a trench or excavation is a cave-in. Common excavations consist of an average depth of 10-15 feet, and when soils cave-in on or around a worker, it will generally result in death.

Control Measures: Any trench or excavation  $\geq 4$  feet in depth must have the following protective measures implemented:

- Perform visual inspections prior to start of work daily and conduct additional inspections warranted by changes in site conditions.
- Provide onsite competent person with the knowledge and authority to correct any noted hazards derived from daily visual inspections.
- Keep all tools, materials, equipment and workers at least 2 feet away from edge of trench/excavation.
- Ladder or other means of egress in accordance with 29 CFR 1926.651(c)(2) must be provided by the subcontractor and be present onsite at all times – PPM requires a ladder be present onsite under these conditions regardless of whether a worker enters the trench/excavation.
- When controls are used and workers are required to enter a trench/excavation, ladders must be placed so that workers are not required to travel lateral distances greater than 25 feet.

OSHA requires that any trench/excavation with a depth  $\geq 4$  feet use engineering controls to prevent cave-ins. In addition, OSHA also requires that any trench/excavation with a depth  $\geq 20$  feet use a qualified engineer to determine the appropriate engineering control. *Note: Under no circumstances must any individual enter a trench/excavation with a depth of 4 feet or greater without the use of engineering controls. In addition, no equipment requiring an individual to be placed on or inside the equipment during its operation is permitted inside the trenched/excavated area. Soil packing and obtaining samples must be conducted through alternative methods.*

### 3.2.20 Weather

#### 3.2.20.1 Heat Stress

Heat is a common concern for states in the southern U.S. and the use of personal protective clothing only adds to this stress. Heat stress can occur in as little as 15 minutes. Symptoms are generally progressive but some exceptions do apply. Some symptoms of heat stress may not arise, may go unnoticed or may occur simultaneously depending on the degree of progression and the awareness level of the worker. The following symptoms are associated with heat stress:

- Heat rash – skin rash caused by plugged sweat ducts due to perspiration
- Fainting – blood is not circulated properly to the brain and typically results from extended periods of standing in conjunction with immobility
- Dehydration – extreme water loss; workers will experience thirst
- Heat cramps – leg or stomach muscle cramps due to loss of sodium and potassium through perspiration
- Heat exhaustion – profuse sweating and clammy skin
- Heat stroke – core body temperature rises to life-threatening condition (104°F)

*Control Measures:* Heat stress can occur very rapidly; therefore, workers must be alert to the signs and symptoms and should be additionally aware of sluggishness or behavioral changes in their co-workers. Workers should be acclimated to their environment and breaks should be taken as necessary to replenish fluids and cool down core body temperature. Alternate workers as necessary to keep work going. Remove excess protective clothing and break in a shaded, cool area. Any worker exhibiting symptoms of heat stress will be prohibited from performing additional duties for the remainder of the day.

#### 3.2.20.2 Cold Stress

The degree of coldness depends upon temperature, wind and wetness. When exposed to colder climates, the body loses heat faster than it can be generated. Prolonged exposures can rapidly use up the body's stored energy resulting in the following:

- Trench foot – injury to feet when immersed in water for prolonged periods resulting in reddening of skin, numbness, leg cramps, swelling, tingling pain, blisters or ulcers, bleeding under skin, and gangrene
- Chilblain – damage to capillary blood vessels in skin resulting in redness and itching mostly on cheeks, ears, fingers and toes; possible blistering, inflammation and ulceration in extreme cases
- Frostbite – injury caused by freezing of the skin, reduced blood flow to hands/feet, numbness, tingling or stinging, aching, bluish or pale, waxy skin which may lead to amputation
- Hypothermia – body loses heat faster than it can generate it resulting in (early symptoms) shivering, fatigue, loss of coordination, confusion and disorientation; (late symptoms) no shivering, blue skin, dilated pupils, slowed pulse and breathing and loss of consciousness

*Control Measures:* Workers should be acclimated to their environment, wear multiple layers of clothing, remove wet or damp clothing promptly and breaks should be taken as necessary to drink warm fluids and warm core body temperature. Alternate workers as necessary to keep work going. Any worker exhibiting symptoms of cold stress will be prohibited from performing additional duties for the remainder of the day.

### 3.2.20.3 Adverse Weather Conditions

Adverse weather conditions can include heavy rainfall, thunderstorm, lightning, hail, snow, tornado watch/warning, tropical storm or hurricane advisory to name a few. These types of weather conditions interfere with travel and field work. Workers who attempt to drive under these conditions put themselves at risk.

*Control Measures:* Follow local weather advisories and postpone work as necessary. Weather conditions can change rapidly while onsite. Carry NOAA weather radios when in the field to monitor changes in weather. Be prepared to use stop-work authority as necessary to address changes in weather. Plan your escape route in advance and be prepared to move to higher ground and/or evacuate. Never drive through flooded roads.

## 3.3 BIOLOGICAL HAZARDS AND CONTROLS

### 3.3.1 Insects and Mosquitoes

Insects and mosquitoes are prominent in just about any work location. Large ant beds as well as other insect nests such as hornets, wasps, yellow jackets and bees can be found as early as spring. They can reside in trees, high vegetative areas, holes within the ground or within piles of trash and debris.

Mosquitoes can carry infectious diseases such as West Nile virus and Zika virus, which can cause long-term debilitating illnesses, birth defects, or fatality. They are most active at dusk or dawn. Symptoms vary and can appear between 3-14 days after a bite.

- West Nile: (mild symptoms) – fever, headache, body aches, nausea, vomiting, and swollen lymph glands or skin rash on chest, stomach and back; symptoms may last for several days to a few weeks; occurs in up to 20% of people infected; (severe symptoms) – high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis; symptoms may last for several weeks and neurological symptoms may be permanent; occurs in 1 out of 250 people infected.
- Zika: mild fever, skin rashes, muscle and joint pain, and conjunctivitis (pink eye) that usually last between 2-7 days; can cause severe birth defects in offspring of pregnant women.

*Control Measures:* PPM contracts a professional spraying company to spray for insect nests; however, workers should carry pest-control materials as necessary and keep extra cans of wasp, hornet, bee and ant spray as a secondary precaution. Workers required to carry allergy treatments such as an epinephrine injection (epipen) must keep this nearby at all times, and co-workers must know the location of this treatment should it be needed. To prevent mosquito bites, use insect repellent containing DEET, wear long-sleeved shirts and long pants and remove any standing water from buckets or barrels where mosquitoes can lay their eggs.

### 3.3.2 Ticks and Spiders

Spiders can be found in highly vegetative areas, in and around remediation systems and in other similar areas. Black widow spiders are commonly found inside well vaults, beneath a system in dark crevices and other similar dark spaces.





Ticks can be encountered in highly vegetative areas with limited grounds keeping. Ticks are external parasites and there are more than 800 different species. Deer ticks carry Lyme disease, but <5% of all tick bites result in Lyme infection. Symptoms of Lyme infection include: flu-like illness with red skin rash that occurs within 3 weeks of bite. Rash should be circular and can increase daily. Symptoms of exposure should be reported immediately to the safety department and medical attention should be sought as necessary.

*Control Measures:* PPM contracts a professional spraying company to spray for spiders when also spraying for insects. Avoid placing hands and arms in dark spaces that cannot be seen. Use caution when opening well vaults or when working in other dark places. Do post-job body inspection and remove ticks immediately.

### 3.3.3 Rodents, Reptiles and Roaming Animals

The southeast U.S. is home to various species of venomous snakes. Venomous snakes will likely be found beneath piles of debris, near bodies of water or in high or heavily vegetative areas. They generally have a triangular-shaped head, elliptical pupils, and some have rattlers. A few common species of venomous snakes are identified below.

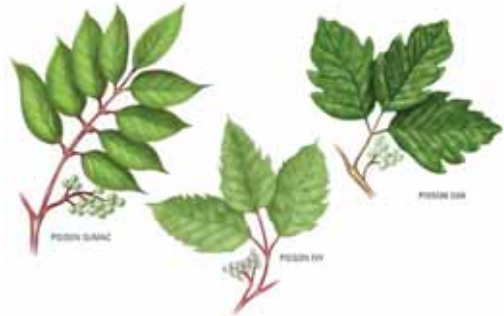


Facilities located near lakes, rivers, bayous, streams or that otherwise have ponds may have alligators present. Alligators will come out of the water and onto land surface to build nests for their eggs or to sunbathe. They are also known to lie beneath the water's surface in wait when they are preparing to attack and they may not be visible to workers. Highly vegetative areas and areas with trash or debris can be home to rodents such as rats or mice. Remediation systems provide warmth in colder climates and it is not uncommon to find rodents and other animals within or around the unit. Sites located in populated areas may have wandering animals. Pets may be trained to attack when approached, may have mange (parasitic skin diseases) or may carry other diseases.

*Control Measures:* When working in or around bodies of water, be aware of any indicators of alligator presence, which require immediate evacuation of the area. General awareness and caution must be used when working in highly vegetative areas. Never place hands or other parts of body in an area that is not clearly visible. Snake guards/chaps should be worn when working in suspected snake-infested areas. Workers must avoid wandering animals – they may appear to be a pet; however, they can carry diseases and they may bite or scratch.

### 3.3.4 Poison Plants

Heavily vegetative areas may have poisonous plants such as poison ivy, oak or sumac, which produce a poisonous sap called urushiol. Typically the first exposure to these plants may not result in any symptoms as this is classified as a "sensitization period". Future exposures to these plants will then produce bumps often mistaken for mosquito bites until they begin to ooze. This is spread by scratching affected areas and touching other unaffected areas.



**Control Measures:** First line of defense is to be able to identify and avoid these plants. Weed killers should be used to minimize mowing and to eliminate exposure to poison ivy, oak or sumac. It should be noted that poisonous plants still thrive throughout the winter and they are more difficult to locate without their leaves. Workers should wear long-sleeved shirts and long pants tucked into boots when working in highly vegetative areas. Pre-medicated towelettes or lotions form a barrier on the skin and prevent adverse reactions. Rubbing alcohol can remove the oil resin up to 30 minutes after exposure, and antihistamines (non-drowsy) can also be taken post-exposure to minimize the reaction.

### 3.3.5 Bloodborne Pathogens

Sharps hazards come in various forms and may include hypodermic needles, cutting tools or equipment/machinery with sharp edges like box cutters, scissors, machinery blades, etc. Hypodermic needles are occasionally encountered at some jobsites. Needles may be used for insulin injections or drug use. Other sharps may become contaminated upon contact with infected sources. Life-threatening illnesses such as hepatitis or human immunodeficiency virus [HIV] (also referred to as bloodborne pathogens) may be transmitted via contaminated sharps so workers should be extremely cautious at all field locations. Also, bloodborne pathogens can be transmitted from an infected individual to another when providing first aid. All individuals and sharps must be treated as other potentially infectious materials (OPIM).

**Control Measures:** Never reach beneath the remediation system or stick hands in areas not clearly visible. Do a visual inspection before reaching for any component or item. Never recap a needle! Remove needles carefully using puncture-resistant gloves. Place them in plastic containers with a closed lid. Duct tape the lid before discarding. Drop off at community drop sites (where available). This type of waste is considered biohazardous waste; however, only healthcare facilities and medical waste industries are regulated. Be aware that the state of Florida requires disposal of this waste at established drop off locations, but all other states in which PPM has an office only recommend using these locations where available. Avoid contact with sharp edges of equipment/machinery, use cutting tools in accordance with manufacturer's guidelines, and always cut away from or perpendicular to the body. Use the concept of universal precautions for infection control. This concept is to treat all human blood and certain human body fluids as if known to be infectious for HIV, hepatitis B, and other bloodborne pathogens.

### 3.3.6 Infectious Illnesses

Infectious illnesses caused by viral, bacterial, fungal and parasitic agents are often transmitted by infected biological sources such as mosquitoes, humans, birds, pigs, ticks, etc. Such illnesses as influenza, swine and avian flu, coronavirus (COVID-19), HIV, Zika and West Nile virus, tuberculosis, and hepatitis, to name a few, can be acquired through occupational exposures.





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*Control Measures:* Workers will be immunized, where appropriate and available, and personal protective equipment will be provided to eliminate or reduce potential contact with contaminated sources. Illnesses transmitted person-to-person that may result as an epidemic or pandemic event will be addressed through social distancing, telecommuting, and other recommendations or requirements outlined by state and federal agencies. The preventive measures warranted will be dictated by the illness type and mode of transmission; therefore, each situation will be evaluated on a case-by-case basis.

The current illness prevention measures in place to prevent or minimize the spread of COVID-19 include, but are not limited to, the following:

- Get vaccinated;
- Ensure worker temperature is  $\leq 100.4^{\circ}\text{F}$ ;
- Maintain social distances of 6 feet or greater;
- Wear facemask in public settings and when social distancing cannot be maintained;
- Clean and disinfect hands frequently and after contact with commonly-touched sources;
- Clean and disinfect common areas such as restrooms, kitchen, and break areas;
- Clean and disinfect commonly shared vehicles, instruments, tools, or other similar materials; and
- Immediate isolation from others once potential COVID-19 symptoms develop, and management reporting to prevent contact with and spread of infection to others.

*Note:* Additional safety precautions for SARS-CoV-2 are outlined within PPM's Exposure Control and Response Plan for Coronavirus Disease 2019 (COVID-19) and must be implemented in accordance with the plan.

## 4.0 EXPOSURE MONITORING

As part of company-related processes, employees will or have the potential to be exposed to various chemical hazards. Chemicals that pose an inhalation hazard may not be considered a threat to worker health until a regulatory limit or more stringent company-imposed action limit is triggered. In addition, some chemicals can become flammable at certain limits. To ensure workers are not working within hazardous or flammable atmospheres, ambient air monitoring will be performed for any work-related process in which chemicals pose an inhalation hazard and have assigned regulatory limits for permissible worker exposures or are otherwise considered a potential fire hazard. Air monitoring will not be required when working with or near materials considered to be non-hazardous in nature or do not otherwise pose an inhalation or fire hazard to workers.

### 4.1 TERMINOLOGY/DEFINITIONS

In order to determine existing or potential worker overexposures to hazardous or flammable substances, workers must first understand common exposure terminology. Some commonly used exposure terms are defined in the following table:

Term	Definition
Action Limit	Company-assigned exposure limit assigned to a chemical that is more stringent than the regulatory or recommended exposure limit.
Ceiling Limit	Maximum concentration of a chemical a worker can be exposed to at any point during a work shift. This is an instantaneous reading.
Flammability/Explosive Range	The concentration range (LEL-UEL) of a combustible or flammable material (gas/vapor) that will burn or explode when introduced to an ignition source.



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Term	Definition
Immediately Dangerous to Life and/or Health (IDLH)	Concentration of a chemical beyond which a worker will be capable of escaping death or permanent injury without help in less than 30 minutes.
Lower Flammability/ Explosive Limit (LFL/LEL)	The lowest concentration of a gas/vapor needed to produce a fire or explosion when exposed to an ignition source.
Permissible Exposure Limit (PEL)/Threshold Limit Value (TLV)	OSHA's regulatory exposure limit is the PEL, whereas the TLV is used to represent other published recommended exposure limits (NIOSH or ACGIH).
Short-Term Exposure Limit (STEL)	Maximum concentration of a chemical a worker can be exposed to without adverse effects over a 15-minute period (unless otherwise noted) not to exceed 4 times per work shift with 1-hr rest intervals between exposures.
Time-Weighted Average (TWA)	Maximum concentration of a chemical a worker can be exposed to without any adverse effect. Based on an 8-hr day/40-hr week.
Upper Flammability/ Explosive Limit (UFL/UEL)	The highest concentration of a gas/vapor needed to produce a fire or explosion when exposed to an ignition source.

## 4.2 ESTABLISHING EXPOSURE AND FLAMMABILITY LIMITS

### 4.2.1 Exposure Limits

For any material that has an established regulatory or recommended exposure limit, PPM has established a more conservative action limit. It is the company's intention to take some form of action before a worker is exposed at regulatory or recommended levels. The exception to this concept applies only to contaminants with very low exposure limits and also to the detection capabilities of air monitoring equipment.

Action limits are established on a case-by-case basis and in accordance with general industry practice. When ambient air concentrations trigger action limits, engineering, administrative or work practice controls should be incorporated to eliminate the exposure or reduce worker exposures to an acceptable limit. When this cannot be achieved, workers will be required to upgrade personal protective equipment.

### 4.2.2 Flammability Limits

PPM has adopted general industry practice by setting its flammability action limits to be 10% of the regulatory limit. Since lower and upper explosive limits are provided as a percentage, PPM has additionally converted the flammability ranges of commonly encountered combustible and flammable materials into parts per million (ppm). Regardless of the volatile monitoring equipment used, workers will be able to determine when a given work environment is or becomes a flammable environment. Workers must also recognize that when working in environments in which chemical concentrations >UEL, as effective control measures are introduced the chemical concentration will again fall back into the flammability range and ignition sources must be eliminated until concentrations once again fall below the material's assigned LEL.

## 4.3 REGULATORY EXPOSURE LIMITS

Whenever an action, regulatory or recommended exposure limit is triggered, workers must be prepared to immediately report site conditions to management, to develop and implement alternative control measures, to evacuate the site when warranted and/or be prepared to upgrade personal protective equipment (i.e., wear respiratory protection). In order to wear respiratory protection, workers must first be medically cleared by a physician, be fit-tested to a



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specific respirator and have received training in accordance with the procedures outlined within the company's Respiratory Protection program. To ascertain eligibility, workers must receive authorization from the safety department prior to using a respirator.

Action, regulatory, and/or recommended exposure limits assigned to routine chemicals commonly encountered by workers are outlined within the following table:

Constituent	Toxicity					Fire
	Action	PEL/TLV	STEL	Ceiling	IDLH	LEL-UEL
Activated carbon	--	--	--	--	--	--
Alconox <sup>®</sup> [nuisance dust]	5	5	--	--	--	--
Aldrin[pesticide]	0.25	0.25	--	--	25	--
Aluminum[metal]	5	5	--	--	--	--
Aluminum oxide[nuisance dust]	5	5	--	--	--	--
Ammonia[base]	50	50	35†	--	300	15,000-28,000
Arsenic[metal]	0.01	0.01	--	--	5	--
Analytix AN-754GH	--	--	--	--	--	--
Asbestos	0.1	0.1	1	--	--	--
Barium[metal]	0.5	0.5	--	--	--	--
Benzene	1	1	5	--	500	1,200-7,800
n-Butane	400	800	--	--	--	1,600-8,400
Cadmium[metal]	0.005	0.005	--	--	9	--
Calcium hydroxide[base]	5	5	--	--	--	--
Carbon dioxide[dry ice]	2,500	5,000†	30,000	--	40,000	--
Carbon tetrachloride	2	2†	--	25	200	--
Chloroform	2	2†	2 [60-min]	50	500	--
Chromium[metal]	0.5	0.5	--	--	250	--
Coal tar pitch volatiles[PAH]	0.2	0.2	--	--	80	--
Copper[metal]	1	1	--	--	100	--
DDT[pesticide]	1	1	--	--	500	--
Dieldrin[pesticide]	0.25	0.25	--	--	50	--
Diesel	100[skin]	100[skin]	--	--	--	600-7,500
Dust [Total]	15	15	--	--	--	--
Dust [Respirable]	5	5	--	--	--	--
Dust [Portland Cement]	50	50	--	--	--	--
Endrin[pesticide]	0.1	0.1	--	--	2	--
Ethylbenzene	100	100†	125†	--	800	800-6,700
Gasoline	100	300†	500†	--	--	1,400-7,600
Heptachlor[pesticide]	0.5	0.5	--	--	35	--
Hexane	50	50†	--	--	1,100	1,100-7,500
Hydrochloric acid[HCl]	--	--	--	5	50	--
Hydrogen peroxide[30-50%]	1	1	--	--	75	--
Hydrogen Sulfide[H <sub>2</sub> S]	1	1	--	10	100	4,000-44,000
Iron[metal]	--	--	--	--	--	--
Isobutylene	--	--	--	--	--	1,800-9,600
Isopropyl alcohol	200	400†	500†	--	2,000	2,000-12,700
Kerosene	50	100	--	--	--	700-5,000
Klozur[sodium persulfate]	5	5	--	--	--	--
Lead[metal]	0.05	0.05	--	--	100	--
Lindane[pesticide]	0.5	0.5	--	--	50	--
Liquinox <sup>®</sup>	--	--	--	--	--	--



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Constituent	Toxicity					Fire
	Action	PEL/TLV	STEL	Ceiling	IDLH	LEL-UEL
Lubricating oils[motor oil]	--	--	--	--	--	--
Magnesium[metal]	--	--	--	--	--	--
Mercury[metal/vapor]	0.1[skin]	0.1†[skin]	--	0.1†[skin]	10[skin]	--
Methane	--	--	--	--	--	5,000-15,000
Methylene chloride	25	25	125	--	2,300	13,000-23,000
MTBE	50	50	--	--	--	1,000-8,000
Muriatic acid[HCl]	--	--	--	5	50	--
Naphthalene[PAH]	10	10†	15†	--	250	900-5,900
Nitric acid	2	2†	4†	--	25	--
NXT[Klozur – sodium persulfate]	5	5	--	--	--	--
Oil[crude]	0.2[mg/m <sup>3</sup> ]	0.2[mg/m <sup>3</sup> ]	--	--	--	1,000-8,000
ORC®/ORC Advanced®	5	5	--	--	--	--
Ozone	0.05	0.1†	0.3†	0.1	5	--
PCB	0.5[skin]	0.5[skin]	--	--	5	--
Perchloroethylene[PERC]	25	25†	--	150[cap]	150	--
Phosphoric acid[H <sub>3</sub> PO <sub>4</sub> ]	1	1†	3†	--	1,000	--
Potassium hydroxide[base]	2	2†	--	2	--	--
Propane	500	1,000	--	--	2,100	2,100-9,500
RegenOx A or B™	--	--	--	--	--	--
Selenium[metal]	0.2	0.2	--	--	1	--
Silver[metal]	0.01	0.01	--	--	10	--
Sodium carbonate[base]	--	--	--	--	--	--
Sodium hydroxide[base]	2	2	--	2†	10	--
Sulfuric acid[H <sub>2</sub> SO <sub>4</sub> ]	1	1	15†	--	15	--
Tetrachloroethylene[PERC]	25	25†	100	150[cap]	150	--
Toluene	100	100†	150†	300	500	1,100-7,100
Trichloroethylene	50	50†	200†	200	1,000	8,000-10,500*
Vinyl chloride	1	1	--	5[15-min]	--	3,600-33,000
Xylene	100	100†	150†	--	900	1,100-7,000
Zinc[metal]	--	--	--	--	--	--

**NOTES:**

† - More protective OSHA PELs vacated by the 11<sup>th</sup> Circuit Court of Appeals in July 1992; however, OSHA can enforce under the General Duty Clause. PPM will adhere to these exposure limits to ensure worker health and wellbeing is maintained.  
 Diesel, dusts, heavy metals, bases/alkalis, Trap & Treat BOS-200, and PCBs are all measured as mg/m<sup>3</sup> – not ppm!  
 Asbestos is measured as number of fibers per unit air (f/cc); Portland cement is measured as million parts per cubic feet (mppcf).  
 Action limit and PEL are time-weighted averages over 8-hour work period. STEL is TWA over 4 15-min periods, with the exception of asbestos, which has a 30-minute excursion limit. Others are instantaneous readings.  
 PAHs - coal tar pitch volatile components of TPH-D include anthracene, benzo(a)pyrene, chrysene, phenanthrene and pyrene, all of which have the same permissible exposure and IDLH limits; therefore, all components lumped into one group. The only other regulated component of PAH is naphthalene which is a component of crude or refined oil and is listed separately from other PAHs.  
 Only the regulated pesticide components of EPA SWA-846 Methods 8080/8081 are included above.  
 Perchloroethylene (PCE) has a ceiling limit of 200 ppm for 5 minutes within any 3-hr period not to exceed 300 ppm but this has been capped at 150 ppm to match IDLH concentrations for this material.  
 Flammability ranges (LEL-UEL) are set at 10%.

Any constituent not otherwise specified above that is anticipated as part of company-related processes in which workers have the potential to be exposed must be immediately reported to the safety department and will require a site-specific HASP. This HASP will be generated and issued by the safety department and requires a 1-week advanced notice.

### 4.4 MONITORING EQUIPMENT AND CALIBRATION

Because PPM works with a variety of chemicals, not all constituents can be detected with one universal monitoring device. Some monitoring equipment can provide instantaneous readings, while others require laboratory analysis (wet method analysis). In addition, each monitoring device has its advantages and disadvantages. Some commonly used monitoring devices used by PPM include the following:

- **Organic vapor analyzers (OVA).** This monitoring device is used to detect volatile and semi-volatile substances. Some OVAs used by the company include MiniRAE 2000 PGM 7600, GasTech®, RKI Eagle® photoionization detector (PID), and Micro FID® flame ionization detector (FID). The advantage of this monitoring device is that it is a direct-read instrument and provides instantaneous readings. Some disadvantages of this equipment are that it generally does not provide readings less than 1 ppm, it does not give percent LEL or provide oxygen content. OVAs generally detect a group of chemicals and do not indicate which compound is being detected.
- **Ozone meters.** This monitoring device is used to detect ozone gas and is also a direct-read instrument. The ozone meter used by some offices within the company is the EcoSensor Ozone Sensor A-21ZX. It is chemical-specific but has some interference from other oxidizing gases.
- **PortaSens II gas detector.** The monitoring device is a portable, direct-read gas leak detector that has the ability to measure a variety of different gases by simply inserting a gas-specific sensor. This instrument is lightweight and can measure gases such as acetylene, ammonia, carbon monoxide, fluorine, formaldehyde, hydrogen, hydrogen chloride, hydrogen cyanide, hydrogen peroxide, hydrogen sulfide, oxygen, ozone, phosgene, and sulfur dioxide. For a composite list of gases, refer to the manufacturer's website.
- **Portable air monitoring pumps.** These monitoring devices are used to assess continuous personnel and background exposures and are commonly used for sampling heavy metals, asbestos, silica or nuisance/respirable dusts. A common portable air monitoring pump used by the company is the SKC AirChek52®. Pumps are set to a specific flow rate of air (can be low volume or high volume) and contaminants are captured using a filter, which is later sent for laboratory analysis. Some advantages of this monitoring equipment are that these pumps are small, light-weight and portable. Some disadvantages of this monitoring equipment are that they do not provide instantaneous readings; exposures are unknown until laboratory results are received.
- **Personal monitoring badges.** These monitoring devices are used to assess continuous personnel exposures. They are light-weight, easy to use and can target specific constituents as opposed to a group of compounds. Badges must be sent to lab for analysis so they do not provide instantaneous readings. In addition, other constituents with similar chemical make-up can cause interference giving inaccurate exposures so samplers must be able to identify potential cross-interference prior to sampling.
- **Colorimetric indicator tubes.** These monitoring devices are used to assess continuous personnel exposures. Passive diffusion tubes are used when determining longer term exposures and workers need only break off the tip of the tube to initiate sampling. Pumps can also be used to draw in air and generally give a short-term exposure assessment during the period of time the air is extracted. Tubes are contaminant-specific and change color when in contact with the constituent giving an instantaneous reading.





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Colorimetric tubes have a  $\pm 25\%$  degree of error and chemicals with similar make-up can cause interference giving inaccurate exposures so samplers must be able to identify potential cross-interference prior to sampling.

To ensure it is in good working order, air monitoring equipment must be calibrated in accordance with manufacturer recommendations for each monitoring device. Workers must be aware that each office utilizes different monitoring equipment; therefore, readings from instruments calibrated with methane may not be the same as readings from instruments calibrated with hexane. Be sure to use the instrument's conversion tables as provided by the manufacturer when warranted. In addition, some metals can produce toxic gases when burned or exposed to open flames; therefore, the safety data sheet should be referenced when working with metal-contaminated soils.

### 4.5 SAMPLE COLLECTION

To appropriately determine exposures, samples must be collected within the breathing zone (shoulder level) of the worker, subcontractor or other affected pedestrian when relevant to site concentrations and location of these concentrations in relation to the general public. It should be noted that there may be times in which samples must be collected at the source (i.e., inside manhole) for technical purposes. These concentrations must be identified and reported as separate readings not indicative of worker exposures. Additional precautions must be taken to prevent impact to worker breathing zone during the sample collection when at or near the contaminant source. Depending on the concentrations in this given area or when impact to worker breathing zone cannot otherwise be avoided, respiratory protection may be required.

### 4.6 MONITORING FREQUENCY AND DOCUMENTATION

Ambient air monitoring is required prior to field work to establish a baseline and intermittently throughout the course of a project to compensate for changes in site conditions. Samples must be collected every two hours so long as concentrations are well below established action limits. Areas selected for monitoring must compensate for worker/subcontractor exposures, general public exposures, residential areas, potential nearby business exposures, etc. and may warrant numerous collection locations.

When there is a noted increase in ambient site concentrations, the sampling frequency must be increased to every 30 minutes until site conditions indicate a decreasing trend. If site concentrations are elevating at a rapid pace, continuous air monitoring must be conducted to ensure no threshold limits are triggered. This may require temporary postponement of site activities until concentrations can be reduced to an acceptable limit. Whenever any threshold limit is triggered, site activities must be halted and the safety department notified.

All monitoring areas, concentrations, sample collection times and/or notations (i.e., change in site conditions, contaminant source readings, etc.) must be documented using the company's Ambient Air Monitoring Report form. Forms must be completed fully and returned to the safety department for review upon completion of the project.

## 5.0 PERSONAL PROTECTIVE EQUIPMENT

### 5.1 PROJECT-SPECIFIC PPE REQUIREMENTS

Depending on the degree of the hazard(s) posed by field tasks, various levels of protective clothing and equipment may be required. Protective clothing and/or equipment required by routine tasks covered by this HASP are outlined further in the table below. Protective clothing and/or equipment not otherwise covered by this plan will require a site-specific HASP. Contact the HSD for further instructions.





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Field Task	Protective Clothing/Equipment										
	Steel-Toed Shoes <sup>1</sup>	Safety Glasses <sup>2</sup>	High Visibility Shirt/Vest <sup>3</sup>	Gloves <sup>4</sup>	Hearing Protector <sup>5</sup>	Hard Hat (Class E) <sup>6</sup>	Goggles/Face Shield <sup>7</sup>	Respirator (APR) <sup>8</sup>	Harness/Lanyard	Flotation Devices/Buoys <sup>9</sup>	Fire Retardant Clothing <sup>10</sup>
Activated carbon replacement	X		X	X	X	X	X	X	X		
Asbestos inspections or sampling	X	X	X	X				X			
Chemical injection	X	X	X	X	X	X					
▪ Working with dry powder	X		X	X	X	X	X	X			
▪ Working with liquid/mixing w/H <sub>2</sub> O	X		X	X	X	X	X				
Compliance audits/visual inspections[Phase 1]	X	X	X								
DPT - drilling, geoprobing[Hand Auger]	X	X	X	X							
DPT - drilling, geoprobing[Heavy Equipment]	X	X	X	X	X	X					
Groundwater sampling	X	X	X	X							
Mobile vacuum event	X	X	X	X	X						
Mobile ozone	X	X	X	X	X						
Monitoring well plugging and abandonment	X	X	X	X	X	X					
Operation and maintenance of system	X	X	X	X	X						
Remediation system install/demobilization	X	X	X	X	X	X					
Spill bucket replacement/closure	X	X	X	X	X	X					
Trenching and excavating	X	X	X	X	X	X					
UST pull/closure	X	X	X	X	X	X					
Any work over or near water body		X		X			X			X	
Any work performed at oil and gas facility, terminals, or other similar property	X	X		X	X	X					X

1 – Steel-toed boots/shoes or equivalent ANSI-approved composite-toe footwear; rubber boots may be used when working within a boat or near a water body  
2 – Safety glasses must be ANSI-approved and equipped with side-shield protection; prescription lenses are permitted if equipped with side-shield protection  
3 – DOT Class II or III high visibility clothing or safety vests with exposure to traffic and/or mobile equipment  
4 – Nitrile gloves for petroleum contamination; Kevlar®/leather gloves for cutting hazards; other chemical-resistant gloves needed for more stringent chemical hazards  
5 – Ear plugs, canal caps or ear muffs when noise levels ≥85 dB  
6 – Class E hard hats required for protection against electrical hazards  
7 – Safety glasses must be upgraded to goggles or face shield when working with/mixing powders or when working with liquids that present splash hazard  
8 – Air-purifying respirator (half-mask or full-face) required for all asbestos sample collections and when chemical threshold limits are triggered and control measures are ineffective  
9 – Personal flotation devices (life jacket) must be U.S. Coast Guard-approved.  
10 – Fire-retardant clothing is a client-specific requirement; clients within the oil/gas industry generally require fire-retardant clothing

## 5.2 REDUCTION OF PROTECTIVE CLOTHING AND EQUIPMENT

The use of protective clothing and equipment is mandatory at all times during the course of a project except when inside a designated break area. A break area will be assigned by the Site Safety Officer during the pre-entry safety briefing. The break area must be:

- Located a minimum of 50 feet away from the work zone
- Located where ambient concentrations are not > chemical detection limit
- Located out of the way of vehicular traffic and must not hinder any functions of other businesses

The break area must be clearly designated by posting cones, barricades, or caution tape. Affected personnel and subcontractors must be informed of the break area during the pre-work safety briefing. Only when inside the break area may protective clothing and/or equipment be

removed. If the conditions noted above cannot be met, the safety department must be contacted. Variances may be granted based on certain site conditions.

### 5.3 OTHER PROTECTIVE AIDS

Protective equipment can be used in a number of ways to draw attention to the worker or work area, to isolate the work area from unauthorized persons and/or traffic, or to identify the hazard(s) posed by the activity. Common examples of protective equipment used by PPM include, but are not limited to the following:

- Signs, posters, labels
- Cones, barricades, caution tape
- Heavy equipment/machinery or company vehicles
- Steel plate covers or wood for monitoring wells and/or holes
- First aid kit
- Flashing lights
- Flag extensions on cones for greater visibility
- Portable 10 or 20-lb ABC fire extinguishers
- Lockout/tagout devices
- Handheld eyewash bottles

## 6.0 SITE ACCESS, CONTROL, AND DECONTAMINATION

### 6.1 SITE ACCESS

Typical PPM jobsites occur in areas open and accessible to the general public. However, when working at unguarded gated facilities, workers must secure appropriate means of site access from the client. This can include a coordinated effort to meet the client at a designated date and time, or acquiring keys to the facility from the client. *Note: Personnel and/or subcontractors are prohibited from climbing over or crawling beneath site fencing to secure site access.*

### 6.2 DESIGNATED WORK ZONES

#### 6.2.1 Non-Emergency Response Sites

Most offsite activities occur at jobsites either open to the public (i.e., retail gasoline stations) or controlled access to private facilities. In either case, routine business practices, especially those involved in the remediation process, occur after releases have been controlled. Under these conditions, the immediate work area will be defined using caution tape, cones, barricades, vehicles, equipment, or other similar means in order to prevent unauthorized entry of others into the work zone; create a barrier between hazards associated with the task(s) and the public, and eliminate the migration of potentially hazardous substances into clean areas of the property.

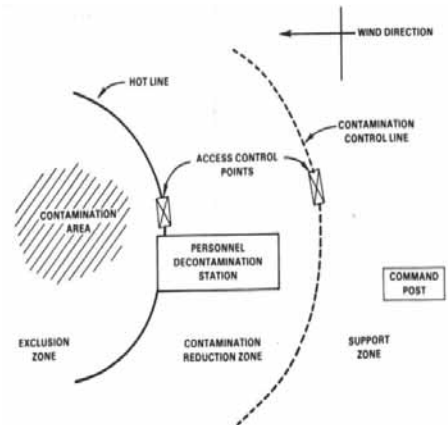
#### 6.2.2 Emergency Response Sites

On occasion, PPM may be required to respond to an active chemical release. Jobsites with the following conditions meet OSHA's definition for a hazardous waste site:

- Uncontrolled releases of hazardous substances;
- Cleanup of RCRA sites;
- Hazardous waste operations at treatment, storage and disposal (TSD) facilities; and
- Emergency response operations for release, or potential threat of release, of hazardous substances.

Work performed at any jobsite that meets the definition of a hazardous waste site requires designated work areas to isolate hazardous work areas from unprotected persons, to prevent the migration of contamination, and to prevent the transfer of contamination through impacted protective clothing as well as monitoring and sampling equipment. Designated work areas include the following:

- Exclusion zone – the area denoting site contamination where heavy equipment operation and sample collection is likely to occur
- Contamination reduction zone – the area surrounding the exclusion zone where clothing and equipment is decontaminated to prevent the transfer of contaminants
- Support zone – any area not otherwise considered the exclusion or contamination reduction zone



### 6.3 AUTHORIZED PERSONNEL

Only authorized personnel are permitted within the work zone (non-emergency response) and/or exclusion or decontamination reduction zones (emergency response). An authorized person is considered to be any individual who has a relevant role or function in relation to the project, participates in onsite safety briefings, and signs the HASP acknowledgement form. Facility managers, client, agency representatives, and law enforcement or regulatory officials may refuse to participate in planned safety meetings or HASP review. As this situation arises, all equipment and job tasks should be temporarily halted to allow for onsite inspection and monitoring by these individuals. When unauthorized persons exit the defined work zone(s), all site activities may resume.

### 6.4 STOP-WORK AUTHORITY

The SSO has full stop-work authority and should use this authority under the following conditions:

- When a hazardous condition, unsafe behavior or other safety concern is noted
- When a near-miss or incident is reported
- When an unauthorized individual enters the designated work zone
- When lightning or other signs of inclement weather is noted within the area
- When a contaminant action limit is triggered
- When unexpected conditions arise that could warrant changes to safety procedures and/or scope of work

### 6.5 GENERAL SITE CONTROL AND SAFETY PRECAUTIONS

The following denotes simple procedures for maintaining site control and worker safety:

- Designated parking and pedestrian walkways in areas a reasonable distance away from active investigation
- Use buddy system whenever feasible
- Perform pre-job inspection to establish appropriate baselines and to visually inspect for obstacles, clearances, etc.
- Avoid smoking on the jobsite unless within authorized areas (i.e., break areas when deemed appropriate by the SSO for smoking)
- Use appropriate safety devices (i.e., cones, barricades, etc.) to clearly identify work zones and break areas
- Prevent unauthorized entry and use stop-work authority as necessary

- Perform post-job inspection to ensure all materials have been removed from the site; pay close attention to the vehicles to ensure animals or person(s) are not located beneath the vehicle and that all cab and toolbox doors have been secured

### 6.6 DECONTAMINATION PROCEDURES

In order to prevent the spread of contamination from impacted work zones, monitoring equipment, sampling equipment, and/or workers, decontamination must take place. Decontamination is defined as the removal or reduction of contaminants. Decontamination procedures vary based on the degree of site contamination as well as the contaminant(s) involved, and this process must take place within the contamination reduction zone. As impacted workers and equipment exit the exclusion zone, they must be decontaminated using appropriate detergent solutions. Disposal protective clothing must be discarded in garbage bags or lined containers for proper disposal.

Typical company functions require a low level of decontamination which involves the cleaning of bailers, purge materials and/or other similar equipment as samples are collected in various areas of a jobsite. Most chemicals in which workers are exposed are classified as skin and eye irritants; therefore, it is important for workers to remove contaminated clothing as soon as possible, flush eyes for a minimum of 20 minutes and usealconox®/liquinox® solution to wash impacted skin.

## 7.0 EMERGENCY RESPONSE

### 7.1 ALARMS AND ONSITE NOTIFICATIONS

To compensate for unexpected conditions and/or changes in existing site conditions, each jobsite must have an effective communication system in place. Workers are notified of emergencies through various forms of effective communication consisting of the following:

- Verbal communication – is generally the most effective form of communication for the majority of all job-related tasks associated with a project
- Hand communication – hand signals are used in place of verbal communication under the following conditions:
  - When noise levels become elevated due to heavy equipment operation or other similar measures that prevent workers from hearing verbal communications
  - When equipment operator's line of vision is obstructed
  - Under any situation deemed necessary by the SSO
- Continuous horn blast of vehicle or air horn – used in lieu of verbal and hand communications due to:
  - Large, dispersed work zones or multiple work areas that prevent overall effectiveness of other forms of communication
  - Multiple site distractions that inhibit immediate worker attention
  - Elevated noise levels that inhibit immediate worker attention

One continuous blast is to be used so as not to confuse workers with other equipment sounds.

### 7.2 PERSONNEL ASSESSMENT AND EVACUATION

Once an alarm has been triggered, workers must be evacuate the work zone and meet in the designated area assigned during the pre-entry safety briefing. This location is determined by the SSO based on distance from existing hazards and verification that it is upwind of any chemical hazard source. Site evacuation is warranted under the following conditions:

- When ambient air concentrations meet or exceed an established action limit assigned for a constituent
- When new hazards not otherwise addressed within this safety plan are encountered
- When subcontractor, field personnel, clients, or regulatory officials violate the safety provisions outlined within this plan
- Upon client or regulatory agency request
- Under any condition the SSO deems unsafe

When evacuation is warranted, all field personnel and subcontractors will meet at the designated area for a preliminary head count, which is conducted by the SSO. Further provisions will be discussed at that time.

### 7.3 INCIDENT, NEAR-MISS, AND HAZARD RECOGNITION REPORTING

Incidents, near-misses or other noted hazards must be reported promptly to the safety department so that each case can be further investigated to determine the root-cause of the event in order to prevent future recurrences. An incident is defined as an occurrence that results in worker injury or property damage. Examples of an incident include, but are not limited to, the following:

- Underground storage tank (UST) puncture
- Auto-related accident regardless of fault
- Contact with overhead or subsurface utilities (i.e., water, sewer, telephone, fiber optic, power, transfer product lines, etc.)
- Chemical spill or release
- Slips, trips, or falls

A near miss is defined as an unplanned event that did not result in injury, illness or damage but had the potential to do so. Unexpected hazards may arise from unsafe acts or conditions or changes in site conditions. Incidents, near-misses and hazards must be reported to the safety department immediately once the site has been secured. The site is considered secured once all leaks have been properly contained, and the area has been evacuated and further isolated to prevent unauthorized entry. All reports must be made to the District Manager or can be made to the safety department directly. In addition, all reports must be documented using the Incident, Near-Miss and Hazard Recognition Report.

### 7.4 INJURY REPORTING AND CASE MANAGEMENT

Any incident that results in injury must be reported immediately to the HSD. Reported injuries or illnesses that warrant medical care must be managed by the safety department. In order to achieve this, all cases are evaluated for medical necessity. Whenever possible, workers are sent to the company's pre-established occupational medicine clinics that specialize in work-related injury care. Workers are permitted to seek medical attention (911) without prior company consent only when the injury appears to be life-threatening or when the injury requires immediate medical attention and contact with designated company officials cannot be achieved.

Workers who seek medical attention without company consent will be required to pay for their own medical care out-of-pocket. This provision also applies to follow up care when an injury/illness does not get better. Workers must additionally report changes in medical condition to the HSD, and additional medical evaluations must be coordinated by the company.



### 7.5 GENERAL MEDICAL CARE AND FIRST AID

It is company policy that all field workers be trained in adult CPR and first aid. Workers who have received this level of training should be prepared to administer care for minor injuries. Certified workers may additionally be called upon to provide care to more seriously injured persons while waiting for additional medical attention. If the victim is conscious, workers must indicate that they are certified and they must additionally obtain consent prior to administering care. Consent is implied when the victim is unconscious.

Some general emergency care provisions are outlined below (not all-inclusive):

Hazard Category	Hazard	Response
Chemical	Inhalation	Move worker to fresh air. If vomiting, dizzy or groggy, seek medical attention immediately. Administer CPR if certified.
	Dermal/Contact	Remove contaminated clothing and flush affected area with soap/water for ~20 minutes. Seek medical care if pain persists.
	Ingestion	Seek immediate medical attention. Do not give fluids to an unconscious person. Do not induce vomiting.
	Eye	Flush with copious amounts of water for ~20 minutes. Seek medical attention if pain persists.
Physical	Heat stress	Apply warm, damp heat and pressure to reduce pain in legs/abdomen. Give electrolyte drinks by mouth, if conscious. Remove excess clothing and attempt to cool core body temperature promptly using cold water. Medical attention is warranted for extreme heat stress.
	Cold stress	Remove any wet clothing immediately and bundle in extra clothing and/or blankets. Drink warm fluids, if conscious. Attempt to warm core body temperature using heater or other methods. Medical attention is warranted for extreme cold stress.
	Sprain/strain	Use combination heat/cold therapies to reduce swelling and apply pain relief. Take an over-the-counter naproxen sodium (Aleve) or ibuprofen (Advil) for pain and inflammation. Seek medical attention if pain persists for more than a few days.
	Tingling/numbness	Generally an indication of swelling but can lead to permanent nerve damage. Take an over-the-counter naproxen sodium (Aleve) or ibuprofen (Advil) for pain and inflammation. Seek medical attention if symptoms persist.
	Cuts/lacerations	Apply pressure to wound for blood to clot and use bandages to cover wound. Antibiotic creams can prevent infection. Seek medical attention for deep cuts that require stitches.
	Ringing in ears	Symptom of hearing loss, which will require medical testing to determine if this is a temporary or permanent hearing loss.
Biological	Needle stick	Immediately remove needle. Squeeze the area to extract blood from the wound. Seek immediate medical care and carry the needle with you to the medical clinic.
	Insect/spider/tick/animal bite	Immediately remove insect or tick and pay close attention over the next few days for symptoms of delayed illness. Seek medical attention if noted. Seek medical attention for black/brown widow and brown recluse spider bites as well as animal bites.
	Poison plants	Pay attention for evidence of allergic reaction (itching, redness and irritation) and seek medical attention if over-the-counter remedies prove ineffective or if affected area spreads.





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## HEALTH AND SAFETY PLAN

Hazard Category	Hazard	Response
Biological	Infectious Illness [COVID-19]	If potential COVID-related symptoms present while onsite, isolate yourself from other workers and maintain distances in much greater excess than 6 feet. Inform workers onsite (call them if necessary) to inform them of your current condition. Report your symptoms to management immediately. Minimize the amount of contact you have with commonly shared materials such as the vehicle, field paperwork, tools, etc. Self-quarantine until tested negative or upon management permission to return to work as based on CDC recommendations for symptoms approach.

*Caution: Individuals with heart problems, on a "low sodium" diet, or who otherwise have blood pressure issues and work in hot environments should consult a physician for proper alternative care when working under these conditions.*

### 7.6 HAZARDOUS SUBSTANCE RELEASE

In the event that hazardous substances migrate from the work zone and potentially endanger unprotected personnel or the community, the area will be isolated and the spill contained and cleaned by authorized personnel. On-site activities will cease until the release is brought under control and the site is returned to its previous condition or otherwise poses no additional harm to site personnel. All hazardous materials must be containerized and labeled until it can be profiled and disposed in accordance with regulatory requirements at an approved landfill. Workers should reference the SDS for additional information.

### 7.7 REGULATORY, CLIENT, OR OTHER AGENCY NOTIFICATIONS

In the event of an emergency, all reporting must be made to your direct project or office manager and/or safety department. Other required client, regulatory or other agency notifications will be made by management within appropriate reporting deadlines.

## 8.0 WASTE MANAGEMENT

Under normal conditions associated with the remediation process, groundwater monitoring wells are purged of impacted groundwater and as part of the investigation process, impacted soils are stored within containers until these wastes can be profiled and disposed at an approved landfill. Other chemicals may be ordered for maintenance or to otherwise facilitate the remediation process. It is the company's objective to ensure all containers are in good condition and labeled appropriately so as to prevent any release of contaminated materials from these containers until it can be appropriately disposed.

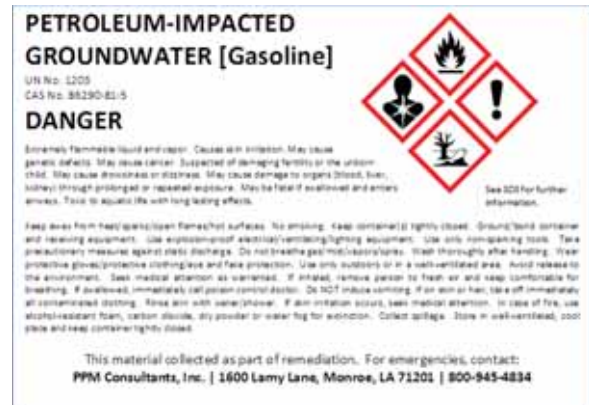
### 8.1 CONTAINER LABELING

All containers used by the company must be appropriately labeled – even when a waste is in accumulation or a material is still in use. Containers are defined by the company as any bucket, bottle, barrel, drum, jar, tote, can, box, crate, tank, or other similar means used to contain, store, and/or transport materials. Containers may be movable or stationary and can vary in weight and dimension; however, common containers used by the company include drums, totes, buckets, soil bags or super sacks.

#### 8.1.1 Hazardous Material/Waste Labeling

Any hazardous material or waste container(s) must be labeled in accordance with 29 CFR 1910.1200 using a globally harmonized system (GHS) for chemical classification and labeling. Tags using the same GHS-format should be used for soil bags and super sacks. Each label must contain six required elements, which include the following:

- Product identifier – should match the product name on the safety data sheet
- Signal word – “danger” (severe) or “warning” (less severe)
- Hazard statements – phrase assigned to a hazard class used to describe the nature of the product’s hazards
- Precautionary statements – a measure to minimize or prevent adverse effects that results from exposure
- Supplier identification – name, address, and telephone number of the supplier or manufacturer\*
- Pictograms – graphical symbols used to convey specific hazard information visually



*\*Note: Hazardous materials ordered by PPM must have the manufacturer or supplier information posted on the containers; however, materials generated as part of the remediation process must identify PPM as the emergency contact.*

### 8.1.2 Nonhazardous Material/Waste Labeling

Containers of nonhazardous materials and/or wastes must also be labeled. They will be labeled using the same labeling system as addressed within the previous section; however, workers should expect these labels to be less detailed since these materials are not likely to pose hazards. Continued use of this labeling system will permit workers to identify the contents of any container used by the company.

Once materials have been deemed as a waste, then non-hazardous waste labels must additionally be affixed to the container(s) so long as the material is truly considered to be a nonhazardous substance. Verbiage for this label template has been modified to meet the needs of the company, and workers are required to complete the label in accordance with the following requirements:



- Generator – PPM must never be identified as the generator; wastes are generated on behalf of the client and therefore, must have the client’s name.
- Contact – PPM will be considered the contact; this will enable clients with multiple subcontractors to identify which of their contractors is generating the waste.
- Phone – Provide PPM’s phone number in case of emergency (800-945-4834).
- Contents – Identify the material being stored within the container.
- Start date – Indicate the date that the material is first placed inside the container; if the container will be accumulating, worker must still provide a date and must also indicate that it is in accumulation.

### 8.2 CONTAINER STORAGE AND DISPOSAL

In accordance with company policy, all wastes must be stored within fenced remediation systems, behind buildings or in other inconspicuous areas so as not to be disturbed by unauthorized individuals. Wastes must also be profiled and disposed within 90 days of task completion. Drums that are in accumulation may reside onsite for a period no greater than 365



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## HEALTH AND SAFETY PLAN

days. Materials in accumulation must be profiled and disposed at least once per calendar year to ensure container integrity. Variances to this policy must be approved by the District Manager or safety department in advance.

### 8.3 CONTAINER INSPECTIONS

Containers stored at sites with a remediation system undergo routine visual inspections. Inspections occur on a quarterly basis to ensure that container integrity is maintained and that there is no evidence of leakage, excessive rusting, bulging or other forms of container damage that could result in a release. Inspections are documented and retained by the safety department. Evidence of container damage is promptly addressed.

### 9.0 PERSONNEL/CONTRACTOR SAFETY REVIEW

This HASP and any corresponding JSA(s) must be outlined during a safety briefing that is to be held by the SSO. This safety briefing shall occur prior to the start of the project and consists of an entire review of all relevant sections of this safety plan as it relates to all phases of the project. Affected company personnel, subcontractors, clients, and/or regulators assigned to the project must participate in the safety briefing to gain access to the work zone. Changes or additions in site personnel will require an additional safety briefing be conducted with all affected person(s) to permit site access. Participants of the safety briefing will be required to sign a form to acknowledge they have received safety instructions and agree to abide by the provisions outlined within the HASP and JSA.

Additional tailgate meetings shall occur on a daily basis prior to the initiation of work activities. All authorized persons must attend the tailgate meeting held by the SSO to discuss the safety provisions affected by the task(s) to be performed for that day. Each participant will be required to sign the tailgate meeting log to acknowledge they have received safety instructions and agree to abide by those provisions reviewed during the tailgate meeting. ***No one should be permitted to participate in the tailgate meetings until a complete review of the HASP and corresponding JSA(s) has been completed!***

### 10.0 CONTRACTOR RESPONSIBILITY AND SUPERVISION

Subcontractors must abide by all safety procedures outlined within this plan, or they will be required to leave the premises until these procedures are implemented. Subcontractors will be permitted to operate under a separate safety plan as long as it meets the minimum requirements established by this HASP, has been reviewed and approved by the HSD in advance of the project's start date, and does not otherwise conflict with the provisions of this HASP.

Subcontractors may not initiate work without the authorization of PPM, and all subcontracted work must be performed under the supervision of a PPM representative. Managers and field workers must coordinate schedules with the subcontractor(s) in advance of the project. All field processes must be shut down when a PPM representative leaves the jobsite unless otherwise approved by the District Manager; however, notations must be made within the HASP when this exception is granted.

Subcontractors must provide advanced notification when bringing additional chemicals not otherwise covered by this safety plan onto the jobsite. A safety data sheet must be provided to the HSD for review/approval before any chemical will be permitted onsite. If approved, any additional hazards, preventive measures, and emergency response procedures associated with the introduction of these substances must be incorporated into this HASP prior to the start of the project.



# HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

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### 11.0 CONFINED SPACE

Confined space is defined by OSHA as any space that is “large enough and so configured that an employee can bodily enter and perform assigned work, has limited or restricted means for entry or exit, and is not designed for continuous employee occupancy.” In accordance with this definition, PPM will not be conducting any field-related task that can be defined as confined space entry. PPM personnel have not been adequately trained for confined space entry; therefore, in the event site conditions warrant this type of work, a qualified contractor will be hired for this task.

### 12.0 LIST OF ABBREVIATIONS

ACM	asbestos-containing material	MTBE	methyl-tertiary butyl ether
ANSI	American National Standards Institute	NCHRP	National Cooperative Highway Research Program
BGS	below ground surface	NIOSH	National Institute for Occupational Safety and Health
BTEX	benzene, toluene, ethylbenzene, and xylene	NOAA	National Oceanic and Atmospheric Administration
CFR	Code of Federal Regulations	O <sub>2</sub> /O <sub>3</sub>	oxygen/ozone
CHMM	Certified Hazardous Materials Manager	ORC	oxygen release compound
CO/CO <sub>2</sub>	carbon monoxide/dioxide	OSHA	Occupational Safety and Health Administration
CSP	Certified Safety Professional	OVA	organic vapor analyzer
dB	decibel	PACM	presumed asbestos-containing material
DEET	N,N-diethyl-meta-toluamide	PAH	polycyclic aromatic hydrocarbon
DOT	Department of Transportation	PCB	polychlorinated biphenyl
fc	foot-candle	P.E.	Professional Engineer
FID	flame ionization detector	PEL	permissible exposure limit
GFCI	ground fault circuit interrupter	P.G.	Professional Geologist
GHS	Globally Harmonized System of Chemical Classification and Labeling	PIC	Principal-in-Charge
GVWR	gross vehicle weight rating	PID	photo-ionization detector
HASP	health and safety plan	PPM	PPM Consultants, Inc.
HEPA	high efficiency particulate air	ppm	parts per million
HIV	human immunodeficiency virus	SDS	safety data sheet
HMIS	hazardous materials information system	SS	Safety Supervisor
HSD	Health and Safety Director	SSO	Site Safety Officer
HSSE	health, safety, security and environmental	STEL	short-term exposure limit
IDLH	immediately dangerous to life and/or health	SVOC	semi-volatile organic compound
JSA	job safety analysis	TPH	total petroleum hydrocarbon
KV	kilo volt	TLV	threshold limit value
LEL	lower explosive limit	TWA	time-weighted average
LFL	lower flammability limit	UEL	upper explosive limit
		UFL	upper flammability limit
		VOC	volatile organic compound
		UST	underground storage tank

**SAFETY DATA SHEETS  
AND  
FIELD FORMS**

**Note: Safety data sheets and field forms are separate documents that can also be found on the PPM Server via the ipad. Locate the appropriate forms as dictated by the task and/or the Safety Supervisor, complete and return to the Safety Department for recordkeeping.**

**APPENDIX E – EQUIPMENT QUOTES**



# Quote



QUO-44167-N8W4

Ver. 0

8/10/2023

Quote valid for 30 days

**Quoted For:** Matt Ebbert

Phone: 205-919-0169

Email: matt.ebbert@ppmco.com

**Bill To:**

PPM Consultants Inc.

5555 Bankhead Highway

BIRMINGHAM, AL 35210

**Quoted By:** Patricia Scudellari

Phone: 770-925-2855

Email: PScudellari@pine-environmental.com

**Ship To:**

5555 Bankhead Highway

BIRMINGHAM, AL 35210

*Rental prices are per unit*

Item #	Description	Qty	Daily	Weekly	4 Week
55903	DSS-30 Meter 4 port Cable Asse *CUSTOMER NEEDS UNIT WITH A 50 FOOT OR LONGER CABLE*	1	\$203.00	\$568.00	\$1,249.00
55020	YSI ProDSS Display (No GPS)	1			
94703	YSI ProDSS Flow Cell	1			

*Quote does not include applicable taxes or freight unless otherwise specified.*

Comments:

\*\*PLEASE NOTE - PRICING QUOTE IS ONLY VALID FOR 30 DAYS - THERE WILL BE A PRICING INCREASE IN 2024 - PROJECT WILL NEED TO BE RE-QUOTED AT THAT TIME\*\*

\*\*\*DODGES STORE NO. 701\*\*

I accept terms and conditions of this quotation.

\_\_\_\_\_  
**Signature**

\_\_\_\_\_  
**Printed Name**

**Payment Terms:**

Payment due net 30 days for orders shipped in the United States or Canada.

See Terms and Conditions for credit cards accepted for payment.

*Rental Start Date*

Terms and conditions of the Standard Rental Agreement apply.  
Please find our updated Standard Rental Agreement terms and conditions online at:  
<https://www.pine-environmental.com/pages/terms-and-conditions>



Date: 2/28/24

Time: 13:24

# *Email*

SUNBELT RENTALS, INC.

Contract #.. 151003731

To: MATT  
MATT.EBBERT@PPMCO.COM

Company: PPM CONSULTANTS

Message:

From: JULIE GRAY PC1073

Location: OXFORD AL PC1073

Phone: 000 000 0000

Fax #: 00



PC#: 1073
83 AIRGAS DR
ANNISTON, AL 36207 6124
256-342-0414

SUNBELT RENTALS, INC.
Salesman: 107301 ANDERSON, JAMES (10)
Typed By: JGRAY1

Job Site:
PPM CONSULTANTS
6658 HIGHWAY 46
HEFLIN, AL 36264 6106

C#: 205-836-5650 J#: 205-919-0169

Customer: 5309550
PPM CONSULTANTS
5555 BANKHEAD HWY
BIRMINGHAM, AL 35210

QUOTE



Contract #.. 151003731
Contract dt. 2/28/24
Date out.... 6/01/24 7:00 AM
Est return.. 6/02/24 7:00 AM
Job Loc..... 6658 HIGHWAY 46, HEFLIN
Job No..... 24- PPM CONSULTANTS
P.O. #.....
Ordered By.. EBBERT, MATT
NET 30

Table with columns: QTY, EQUIPMENT #, Min, Day, Week, 4 Week, Amount. Includes items like SKIDSTEER and PALLET FORKS, and a summary section for SALES ITEMS with sub-totals and taxes.

\*\*\*\*\*

IF THE EQUIPMENT DOES NOT WORK PROPERLY, NOTIFY THE OFFICE AT ONCE
MULTIPLE SHIFTS OR OVERTIME RATES MAY APPLY
CUSTOMER IS RESPONSIBLE FOR REFUELING, DAMAGES AND REPAIRS
1. The total charges are an estimate based on the estimated rental period and other information provided by Customer.
2. Customer assumes all risks associated with the Equipment during the Rental Period, including injury and damage to persons, property and the Equipment.
3. Customer is responsible for and shall only permit properly trained, Authorized Individuals to use the Equipment.
4. If the Equipment does not operate properly, is not suitable for Customer's intended use, does not have operating and safety instructions or Customer has any questions regarding use of the Equipment, Customer shall not use the Equipment and shall contact Sunbelt immediately.
5. Equipment misuse or using damaged or malfunctioning Equipment may result in serious bodily injury or death and Customer agrees that Customer (i) assumes all risk associated thereunder, and (ii) indemnifies Sunbelt Entities for all claims or damages as a result of misuse or use of damaged or malfunctioning Equipment.
6. Customer has received, read, understands and agrees to the estimated charges and all the terms on this page, plus all sections on the reverse side of this Contract ("Sections"), including Release and Indemnification in Section 8 and Environmental Fee in Section 16, which can also be found at www.sunbeltrentals.com/rentalcontract. \*Delivery/Pickup Surcharge fee explanation is available at www.sunbeltrentals.com/surcharge.
7. Customer must contact Sunbelt to request pickup of Equipment, retain the Pick-Up Number given by Sunbelt and will be responsible for Equipment until actually retrieved by Sunbelt.
8. Customer waives its right to a jury trial in any dispute as set forth in Section 19.
9. At the election of Sunbelt or Customer, Customer agrees to submit every dispute to arbitration and waives any right to bring a class action as set forth in Section 20.

Continued on the next page...



PC#: 1073
83 AIRGAS DR
ANNISTON, AL 36207 6124
256-342-0414

SUNBELT RENTALS, INC.
Salesman: 107301 ANDERSON, JAMES (10)
Typed By: JGRAY1

QUOTE



Job Site:
PPM CONSULTANTS
6658 HIGHWAY 46
HEFLIN, AL 36264 6106

C#: 205-836-5650 J#: 205-919-0169

Customer: 5309550
PPM CONSULTANTS
5555 BANKHEAD HWY
BIRMINGHAM, AL 35210

Contract #.. 151003731
Contract dt. 2/28/24
Date out.... 6/01/24 7:00 AM
Est return.. 6/02/24 7:00 AM
Job Loc..... 6658 HIGHWAY 46, HEFLIN
Job No..... 24- PPM CONSULTANTS
P.O. #.....
Ordered By.. EBBERT, MATT
NET 30

Table with 7 columns: QTY, EQUIPMENT #, Min, Day, Week, 4 Week, Amount

All amounts are in USD

\*\*\*\*\*

IF THE EQUIPMENT DOES NOT WORK PROPERLY, NOTIFY THE OFFICE AT ONCE MULTIPLE SHIFTS OR OVERTIME RATES MAY APPLY CUSTOMER IS RESPONSIBLE FOR REFUELING, DAMAGES AND REPAIRS

- 1. The total charges are an estimate based on the estimated rental period and other information provided by Customer.
2. Customer assumes all risks associated with the Equipment during the Rental Period, including injury and damage to persons, property and the Equipment.
3. Customer is responsible for and shall only permit properly trained, Authorized Individuals to use the Equipment.
4. If the Equipment does not operate properly, is not suitable for Customer's intended use, does not have operating and safety instructions or Customer has any questions regarding use of the Equipment, Customer shall not use the Equipment and shall contact Sunbelt immediately.
5. Equipment misuse or using damaged or malfunctioning Equipment may result in serious bodily injury or death and Customer agrees that Customer (i) assumes all risk associated thereunder, and (ii) indemnifies Sunbelt Entities for all claims or damages as a result of misuse or use of damaged or malfunctioning Equipment.
6. Customer has received, read, understands and agrees to the estimated charges and all the terms on this page, plus all sections on the reverse side of this Contract ("Sections"), including Release and Indemnification in Section 8 and Environmental Fee in Section 16, which can also be found at www.sunbeltrentals.com/rentalcontract. \*Delivery/Pickup Surcharge fee explanation is available at www.sunbeltrentals.com/surcharge.
7. Customer must contact Sunbelt to request pickup of Equipment, retain the Pick-Up Number given by Sunbelt and will be responsible for Equipment until actually retrieved by Sunbelt.
8. Customer waives its right to a jury trial in any dispute as set forth in Section 19.
9. At the election of Sunbelt or Customer, Customer agrees to submit every dispute to arbitration and waives any right to bring a class action as set forth in Section 20.

Customer is declining Rental Protection Plan (see reverse side for details) \_\_\_\_\_ (Customer Initials)

Customer Signature Date Name Printed Delivered By Date

**SUNBELT RENTALS TERMS AND CONDITIONS**

1) **DEFINITIONS. "Authorized Individuals"** are those individuals that Customer directly or indirectly allows to use the Equipment, who must be properly trained to use the Equipment, at least 18 years old or the legal age of majority in the state, whichever is greater and are not under the influence of any drugs, alcohol, substances or otherwise impaired. **"Customer"** is identified earlier and includes any of your representatives, agents, officers, employees or anyone signing this Contract on your behalf. **"Environmental Services Charge"** is the charge described in Section 17. **"Equipment"** is the equipment and/or services rented on any other dates provided, together with all replacements, repairs, additions, attachments and accessories and all future Equipment identified. **"Incident"** is any fire, citation, theft, accident, casualty, loss, vandalism, injury, death or damage to person or property, claimed by any person or entity that appears to have occurred in connection with the Equipment. **"Loss"** means the Equipment is either stolen, its location is unknown, or Customer is unable to recover it for a period of 30 days. **"FMV"** is the Equipment's fair market value on or about the date of the Incident relating to the Equipment, plus any administrative fees and expenses. **"One Shift"** means not more than 8 hours per day, 40 hours per week and 160 hours every 4-week period, provided that double shift will be 150% and triple shift will be 200% of the rental charge on Equipment with hour meters. **Ordinary Wear and Tear** means normal deterioration considered reasonable in the equipment rental industry for One Shift use. **"Party"** means Sunbelt or Customer and together both are the "Parties". **"Pick-Up Number"** is the number Customer obtains from Sunbelt evidencing the Customer's call to pick up Equipment. **"Rental Period"** commences when the Equipment is delivered to Customer or the Site Address and continues until the Equipment is returned to the Store or picked up by Sunbelt during normal business hours, provided Customer has otherwise complied with this Contract. **"RFP"** is the rental protection plan described in Section 10. **"Site Address"** is the location that Customer represents the Equipment will be located during the Rental Period identified earlier. **"Store"** is the Sunbelt location identified earlier. **"Sunbelt"** is Sunbelt and its affiliated companies, their respective officers, directors, employees and agents. **"Telematics Data"** is data collected within the Equipment or via software relating to the Equipment, its performance, location, or operators. Transportation Surcharge is a charge intended to defray a wide range of transportation expenses (both direct and indirect), which are not always fully recovered by other transportation charges.

2) **TERMS. Customer's execution of this Contract or taking possession of the Equipment (whichever occurs first) shall be deemed acceptance of the terms herein for this and all past and future contracts between Sunbelt and Customer upon Customer's receipt of Sunbelt's Equipment under those contracts. Customer rents the Equipment from Sunbelt pursuant to this Contract, which is a true lease. The Equipment (a) is and shall remain the personal property of Sunbelt and (b) shall not be affixed to any other property. Customer shall not pledge or encumber the Equipment in any manner.**

3) **PERMITTED USE.** Customer agrees and warrants that (a) Sunbelt has no control over the manner in which the Equipment is operated during the Rental Period by Customer or any third party that Customer implicitly or explicitly permits, (b) prior to each use and its return to Sunbelt, Customer shall inspect the Equipment to confirm that the Equipment is in good condition, without defects, readable decals are on the Equipment, and the Equipment is suitable for Customer's intended use, (c) Customer has access to and reviews the operating and safety instructions and will operate the Equipment in accordance with the manufacturer's instructions and with applicable safety equipment, (d) any apparent agent at the Site Address is authorized to accept delivery of the Equipment (and if Customer requests, Customer authorizes Sunbelt to leave the Equipment at the Site Address without requirement of written receipt), (e) Customer shall immediately stop use and notify Sunbelt if the Equipment is damaged, unsafe, disabled, malfunctioning, warning lights come on, levied upon, threatened with seizure, lost, or if any Incident occurs, (f) Customer has received from Sunbelt all information needed or requested regarding the operation of the Equipment, (g) Sunbelt is not responsible for providing operator or other training unless Customer specifically requests in writing and Sunbelt agrees to provide such training (Customer being responsible to obtain all training that Customer desires prior to the Equipment's use), (h) Sunbelt is not responsible for Customer's obligation to provide reasonable accommodation(s) to any (disabled) Authorized Individual(s), (i) only Authorized Individuals shall use and operate the Equipment, however Customer is responsible for the Equipment and its use during the Rental Period regardless of the user, (j) the Equipment shall be used and maintained in a careful manner, within the Equipment's capacity and in compliance with all applicable laws, regulations, as well as all operating and safety instructions provided on, in or with the Equipment and all applicable federal, state and local laws, permits and licenses, including but not limited to, OSHA and ADA, as revised, (k) the Equipment shall be kept in a secure location, and (l) Customer shall provide Sunbelt with accurate and complete information, which Sunbelt relies upon to provide the appropriate Equipment to Customer.

4) **PROHIBITED USE.** Customer shall not (a) alter or cover up any decals or insignia on the Equipment, remove any operating or safety equipment or instructions or alter or tamper with the Equipment, (b) assign its rights under this Contract, (c) move the Equipment from the Site Address without Sunbelt's written consent, (d) use the Equipment in a negligent, illegal, unauthorized or abusive manner, or (e) publicize use of the Equipment in any manner (including, without limitation, print, audiovisual or electronic), or (f) allow the use of the Equipment by anyone other than Authorized Individuals (Customer acknowledging that the Equipment may be dangerous if used improperly or by untrained parties).

5) **MAINTENANCE.** Customer shall perform routine maintenance on the Equipment, including routine inspections and maintenance of fuel and oil levels, grease, cooling and fluid systems, batteries, tires/tracks cutting edges, and cleaning in accordance with the manufacturer's specifications, as applicable. All other maintenance or repairs may only be performed by Sunbelt or its agents, but Sunbelt has no responsibility during the Rental Period to inspect or perform any maintenance or repairs unless Customer requests a service call. If Sunbelt determines that repairs to the Equipment are needed, other than Ordinary Wear and Tear, Customer shall pay the full repair charges, additional fees, if any, and rental of the Equipment until the repairs are completed. If Equipment is stolen or damaged in excess of 40% of the Equipment's FMV, Customer will be responsible for the FMV of the Equipment, including sales tax, as applicable. Sunbelt has the right to inspect the Equipment wherever located. Customer has the authority to and hereby grants Sunbelt and its agents the right to enter the physical location of the Equipment for the purposes set forth herein. Sunbelt shall be responsible for repairs needed because of Ordinary Wear and Tear. Customer agrees that repair or replacement of the Equipment is Customer's exclusive remedy for Sunbelt's breach of this Section. Notwithstanding Sunbelt's service commitment, if Customer breaches this Contract, Sunbelt shall have no obligation to stop the Rental Period, commence repairs or rent other equipment to Customer until Customer or its agent agrees to pay for such charges.

6) **CUSTOMER LIABILITY, DURING THE RENTAL PERIOD, CUSTOMER ASSUMES ALL RISK ASSOCIATED WITH THE POSSESSION, CONTROL OR USE OF THE EQUIPMENT, INCLUDING BUT NOT LIMITED TO, PERSONAL INJURY, DEATH, RENTAL CHARGES, THEFT, LOSSES, DAMAGES AND DESTRUCTION, INCLUDING CUSTOMER TRANSPORTATION, LOADING AND UNLOADING, WHETHER OR NOT THE CUSTOMER IS AT FAULT.** After an Incident, Customer shall (a) immediately notify Sunbelt, the police, if necessary, and Customer's insurance carriers; (b) secure and maintain the Equipment and the surrounding premises in the condition existing at the time of such Incident, until Sunbelt or its agents investigate; (c) immediately submit copies of all police or other third party reports to Sunbelt; and (d) as applicable, pay Sunbelt, in addition to other sums due herein, the rental rate for Equipment until the repairs are completed or Equipment replaced plus either (i) the FMV or (ii) the full charges of recovery and repairs of damaged Equipment. Accrued rental charges shall not be applied against these amounts. Sunbelt shall have the immediate right, but not obligation, to reclaim any Equipment involved in any manner.

7) **NO WARRANTIES. SUNBELT DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE EQUIPMENT, ITS DURABILITY, CONDITION, MERCHANTABILITY, NON-INFRINGEMENT, OR FITNESS FOR ANY PARTICULAR PURPOSE. CUSTOMER ACKNOWLEDGES ACCEPTANCE OF THE EQUIPMENT ON AN "AS IS, WHERE IS" BASIS, WITH "ALL FAULTS" AND WITHOUT ANY RECOURSE WHATSOEVER AGAINST SUNBELT ENTITIES. CUSTOMER ASSUMES ALL RISKS ASSOCIATED WITH THE EQUIPMENT AND RELEASES SUNBELT ENTITIES FROM ALL LIABILITIES AND DAMAGES (INCLUDING LOST PROFITS, PERSONAL INJURY, AND SPECIAL, INCIDENTAL AND CONSEQUENTIAL DAMAGES, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES) IN ANY WAY CONNECTED WITH THE EQUIPMENT, ITS INSTALLATION, OPERATION OR USE OR ANY DEFECT OR FAILURE THEREOF, A BREACH OF SUNBELT'S OBLIGATIONS HEREIN OR ERRORS OR INACCURACIES IN INFORMATION OBTAINED FROM CUSTOMER OR THIRD PARTIES, UPON WHICH SUNBELT RELIES; PROVIDED HOWEVER, IF CUSTOMER IS A CONSUMER UNDER APPLICABLE LAW, THEN NO CONSEQUENTIAL DAMAGES LIMITATION OF INJURIES TO PERSONS SHALL APPLY.**

8) **RELEASE AND INDEMNIFICATION. TO THE FULLEST EXTENT PERMITTED BY LAW, CUSTOMER INDEMNIFIES, RELEASES, HOLDS SUNBELT ENTITIES HARMLESS AND AT SUNBELT'S REQUEST, DEFENDS SUNBELT ENTITIES (WITH COUNSEL APPROVED BY SUNBELT), FROM AND AGAINST ALL LIABILITIES, CLAIMS, LOSSES, DAMAGES, AND EXPENSES (INCLUDING ATTORNEY'S AND/OR LEGAL FEES AND EXPENSES) HOWEVER ARISING OR INCURRED, RELATED TO ANY INCIDENT, DAMAGE TO PROPERTY, INJURY OR DEATH OF ANY PERSON, CONTAMINATION OR ALLEGED CONTAMINATION, OR VIOLATION OF LAW OR REGULATION CAUSED BY OR CONNECTED WITH THE (a) ACCESS, USE, POSSESSION OR CONTROL OF THE EQUIPMENT BY CUSTOMER OR ANY THIRD PARTY THAT CUSTOMER IMPLICITLY OR EXPLICITLY PERMITS TO ACCESS, USE, POSSESS OR CONTROL THE EQUIPMENT DURING THE RENTAL PERIOD OR (b) BREACH OF THIS CONTRACT, WHETHER OR NOT CAUSED IN PART BY THE ACTIVE OR PASSIVE NEGLIGENCE OR OTHER FAULT OF ANY PARTY INDEMNIFIED HEREIN AND ANY OF THE FOREGOING ARISING OR IMPOSED IN ACCORDANCE WITH THE DOCTRINE OF STRICT OR ABSOLUTE LIABILITY. CUSTOMER ALSO AGREES TO WAIVE ITS WORKERS' COMPENSATION IMMUNITY, TO THE EXTENT APPLICABLE. CUSTOMER'S INDEMNITY OBLIGATIONS SHALL SURVIVE THE EXPIRATION OR TERMINATION OF THIS CONTRACT.** All of Customer's indemnification obligations under this paragraph shall be joint and several.

9) **INSURANCE.** During the Rental Period, Customer shall maintain, at its own expense, the following minimum insurance coverage: Sunbelt's consent prior to taking such action, including approval of established customs broker, and (b) execute an amendment to this Contract, which (a) for Customers using Equipment for non personal use, general liability insurance of not less than \$1,000,000 per occurrence, including coverage for Customer's contractual liabilities herein such as the release and indemnification clause contained in Section 8; (b) for Customers using Equipment for non personal use, property insurance against loss by all risks to the Equipment, in an amount at least equal to the FMV thereof, unless RFP is elected at the time of rental and paid for prior to any Incident; (c) worker's compensation insurance as required by law; and (d) automobile liability insurance (including comprehensive and collision coverage, and uninsured/underinsured motorist coverage), in the same amounts set forth in subsections (a) and (b), if the Equipment is to be used on any roadway. Such policies shall be primary, non-contributory, on an occurrence basis, contain a waiver of subrogation, name Sunbelt and its agents as an additional insured (including an additional insured endorsement) and loss payee, and provide for Sunbelt to receive at least 30 days prior written notice of any cancellation or material change. Any insurance that excludes boom damage or overturns is a breach. Customer shall provide Sunbelt with certificates of insurance to [insurancecertificates@sunbeltrentals.com](mailto:insurancecertificates@sunbeltrentals.com) evidencing the coverages required above prior to any rental and any time upon Sunbelt's request. To the extent Sunbelt Entities carry any insurance, Sunbelt Entities' insurance will be considered excess insurance. The insurance required herein does not relieve Customer of its responsibilities, indemnification, or other obligations provided herein, or for which Customer may be liable by law or otherwise.

10) **RENTAL PROTECTION PLAN.** Customer's repair or replacement responsibility in Sections 5 and 6 of this Contract is modified by the RPP, if offered on the Equipment, and Sunbelt shall limit the amount Sunbelt collects from the Customer for the Equipment loss, damage or destruction to the following amounts: for each piece of Equipment, per each occurrence: (a) 10% of the FMV for Lost Equipment, up to a maximum of \$500 per piece of Equipment; (b) 10% of the repair charges for incidental or accidental damage to Equipment, up to a maximum of \$300 per piece of Equipment; (c) charges in excess of \$50 per tire for tire repairs; and (d) nothing for the rental charges which would otherwise accrue during the period when damaged or destroyed Equipment is being repaired or replaced by Sunbelt or Lost Equipment is being replaced, provided however, the foregoing RPP liability reduction only applies if the Conditions (defined below) are satisfied and an Exclusion (defined below) does not apply. The RPP is NOT INSURANCE and does NOT protect Customer from liability to Sunbelt or others arising out of possession, control or use of the Equipment, including injury or damage to persons or property. **THE RPP IS A CONTRACTUAL MODIFICATION OF CUSTOMER'S LIABILITY.** All of the following "Conditions" must be satisfied for the RPP and the corresponding liability reduction to apply: (i) Customer accepts the RPP in advance of the rental; (ii) Customer pays 15% of the gross rental charges as the fee for the RPP (plus applicable taxes); (iii) Customer fully complies with the terms of this Contract; (iv) Customer's account is current at the time of the loss, theft, damage or destruction of the Equipment; and (v) none of the Exclusions apply. Customer assumes the Exclusion risks, meaning that if any Exclusion occurs, the RPP does NOT reduce the liability of Customer to Sunbelt for the loss, theft, damage or destruction resulting from such Exclusion. **"Exclusions"** shall mean loss, theft, damage or destruction of the Equipment (A) due to intentional misuse; (B) caused by Lost Equipment not reported to Customer to the police within 48 hours of discovery, and substantiated by a written police report (promptly delivered to Sunbelt); (C) due to floods, water level changes, wind, storms, earthquakes or Acts of God; and (D) accessories or Equipment for which Customer is not charged the RPP fee. **THE EXCLUSIONS REMAIN THE LIABILITY OF CUSTOMER AND ARE NOT MODIFIED BY THE RPP. RPP IS REFLECTED ON THIS CONTRACT AS PART OF CUSTOMER'S ESTIMATED CHARGES UNLESS CUSTOMER HAS ELECTED TO DECLINE RPP IN WRITING, FAILS TO PAY THE RPP FEE OR MADE OTHER CONTRACTUAL ARRANGEMENTS WITH SUNBELT.** Notwithstanding anything to the contrary in this Contract, if Lost Equipment is later recovered, Sunbelt retains ownership of the Equipment regardless of any payments made by Customer or Customer's insurance company with respect to such Equipment, all of which payments are non-refundable. Customer agrees to promptly return any Equipment that is recovered. Sunbelt shall be subrogated to Customer's rights to recover against any person or entity relating to any loss, theft, damage or destruction to the Equipment. Customer

shall cooperate with, assign Sunbelt all claims and proceeds arising from such loss, theft, damage or destruction, execute and deliver to Sunbelt whatever documents are required and take all other necessary steps to secure in Sunbelt such rights, at Customer's expense.

11) **RENTAL RATES.** The total charges specified in this Contract are: (a) estimated based upon Customer's representation of the estimated Rental Period identified herein (rental rates beyond the estimated Rental Period may change) and other information conveyed by Customer to Sunbelt; and (b) for the Equipment's use for One Shift, unless otherwise noted. Weekly and 4 week rental rates shall not be prorated. Rental charges accrue during Saturdays, Sundays and holidays. The rental rates do not include and Customer is responsible for, (i) all consumables, fees, licenses, present and future taxes and any other governmental charges based on Customer's possession and/or use of the Equipment, including additional fees for more than One Shift use; (ii) delivery and pickup charges to and from the Store, including but not limited to any freight, transportation, delivery, pickup and surcharge fees listed in this Contract; (iii) maintenance, repairs and replacements to the Equipment as provided herein; (iv) a cleaning fee if required; (v) miscellaneous charges, such as fees for lost keys, RFP, costs to recover Equipment, emergency mobilization or store opening; (vi) fuel used during the Rental Period and for refueling Equipment as described below; (vii) fines for use of dyed diesel fuel in on-road Equipment; and (viii) an Environmental Services Charge (see [www.sunbeltrentals.com/environmentalfee](http://www.sunbeltrentals.com/environmentalfee)); and (ix) Transportation Surcharge (see [www.sunbeltrentals.com/surcharge](http://www.sunbeltrentals.com/surcharge)). The convenience charge for off road diesel fuel does not include governmental motor fuel taxes or charges. Sunbelt collects these fees as revenue and uses them at its discretion.

12) **PAYMENT.** Customer shall pay for the rental of Equipment, sale of Equipment, materials and all other items and services identified in this Contract and all other amounts due, without any offsets, in full, in advance at the time of rental, unless Sunbelt approves Customer's executed commercial credit application. Commercial customers who are approved for Sunbelt's extended payment terms must pay, in arrears, upon receipt of Sunbelt's invoice, either by cash, check or ACH. Customer must notify Sunbelt in writing of any disputed amounts, including credit card charges, within 15 days after the receipt of the invoice/Customer or Customer shall be deemed to have irrevocably waived its right to dispute such amounts. At

Sunbelt's discretion, any account with a delinquent balance may be placed on a cash basis, deposits may be required and the Equipment may be picked up without notice. Due to the difficulty of fixing actual damages caused by late payment, Customer agrees that a service charge equal to the lesser of 15% per month or the maximum rate permitted by law shall be assessed on all delinquent accounts, until paid in full. Customer shall reimburse Sunbelt for all costs incurred in collecting any late payments, including, without limitation, attorneys' fees. Payment of any late charge does not excuse Customer of any default under this Contract. Customer shall pay a fee of \$75 for each check returned for lack of sufficient funds to compensate Sunbelt for its overhead for processing missed payment. Deposits will only be returned after all amounts are paid in full. **CUSTOMER AGREES THAT IF A CREDIT OR DEBIT CARD IS PRESENTED TO PAY FOR CHARGES OR TO GUARANTEE PAYMENT, CUSTOMER AUTHORIZES SUNBELT TO CHARGE THE CREDIT OR DEBIT CARD ALL AMOUNTS SHOWN ON THIS CONTRACT AND CHARGES SUBSEQUENTLY INCURRED BY CUSTOMER, INCLUDING BUT NOT LIMITED TO, LOSS OF OR DAMAGE TO THE EQUIPMENT AND EXTENSION OF THE RENTAL PERIOD.** Effective June 1, 2021 and where permitted by law, Sunbelt may impose a surcharge of 2% (minimum \$3) for credit card payments on charge accounts. This surcharge is not greater than Sunbelt's merchant discount rate for credit card transactions and is subject to sales tax in some jurisdictions.

13) **RETURN OF EQUIPMENT.** Sunbelt may terminate this Contract at any time, for any reason. The Equipment shall be returned to Sunbelt (when needed for inspections, maintenance and at the end of the Rental Period) in the same condition it was received, less Ordinary Wear and Tear and free of any hazardous materials and contaminants. Customer will return the Equipment at the end of the Rental Period, but will continue to be responsible for rental and other charges after the Rental Period if the Equipment is not returned in the condition required herein. If Sunbelt delivered the Equipment to Customer, Customer shall notify Sunbelt that the Equipment is ready to be picked up at the Site Address and obtain a Pick-Up Number, which Pick-Up Number Customer should keep as proof of the call; provided Customer remains liable for any loss, theft, damage to or destruction of the Equipment until Sunbelt confirms that the Equipment is returned in the condition required herein. Customer will not be charged the rental charges after the date the Pick-Up Number is given, provided Customer has otherwise complied with this Contract. No pickups occur on Sundays or statutory holidays and Saturday pickups are dependent on specific Store hours. If Customer picked up Equipment, Customer shall return

Equipment to the same Store during that Store's normal business hours. If the Equipment is not returned by the estimated end of the Rental Period specified earlier, Customer agrees to pay the applicable rental rate for the Equipment until the end of the Rental Period.

14) **PURCHASES.** If this Contract identifies any Equipment, materials or other items that is to be purchased by Customer, Sunbelt sells and delivers such items to Customer on an "AS IS, WHERE IS" basis, with all faults and without any warranties (other than manufacturer warranties, if any) in consideration for Customer's payment to Sunbelt of the full purchase price of the item. Sunbelt retains title to the item until Customer has paid in full. Sunbelt

15) **DEFAULT.** Customer shall be in default of Sunbelt's terms if: (a) Customer (a) fails to pay sums when due; (b) breaches any Section of this Contract; (c) becomes a debtor in a bankruptcy proceeding, goes into receivership, seeks protection from its creditors under any insolvency legislation, ceases to carry on business, or has its assets seized by any creditor; (d) fails to insure the Equipment as required; or otherwise places the Equipment at risk; (e) fails to return Equipment immediately upon Sunbelt's demand; or (f) is in default under any other contract with Sunbelt. If a Customer default occurs, Sunbelt shall have, in addition to all rights and remedies at law or in equity, the right to repossess the Equipment without judicial process or prior notice. Customer shall pay all of Sunbelt's costs, including reasonable costs of collection, court costs, attorneys and legal fees, incurred in exercising any of its rights or remedies herein. Sunbelt shall not be liable due to seizure of Equipment by order of governmental authority. **CUSTOMER WAIVES ANY RIGHT OF ACTION AGAINST SUNBELT ENTITIES FOR SUCH REPOSSESSION.**

16) **CRIMINAL WARNING.** The use of false identification to obtain Equipment or the failure to return Equipment by the end of the Rental Period may be considered theft, subject to criminal prosecution and civil liability where permitted, pursuant to applicable laws.

17) **ENVIRONMENTAL SERVICES CHARGE.** To promote a clean and sustainable environment, Sunbelt takes various measures to comply with applicable environmental regulations, as well as with Sunbelt's own policies. Sunbelt also incurs a wide range of environmental related expenses (both direct and indirect). These expenses may include services such as waste disposal, construction and maintenance of cleaning facilities, acquisition of more fuel-efficient equipment, as well as, labor costs, administration costs, etc. To help offset these and other costs, Sunbelt assesses an Environmental Services Charge, plus applicable taxes thereon in connection with certain rentals. The Environmental Services Charge is not a tax or governmentally mandated charge and is not designated for any particular use or placed in an escrow account, but is a charge that Sunbelt collects as revenue and uses at its discretion.

18) **FUEL.** For Equipment that uses fuel, Customer has three options: (a) Prepay Fuel Option - Customer may purchase a full tank of fuel for the Equipment at the start of the rental, in which case a "convenience charge" will appear on this Contract (calculated by multiplying the estimated fuel capacity of Equipment by the Prepay per gallon rate). As an added benefit, Customer may return the Equipment full of fuel and the convenience charge will be refunded (however, if not returned full, Customer will not obtain any credit for fuel left in the Equipment upon return); (b) Pay on Fuel Option - Customer returns Equipment with less fuel than when received. Customer shall pay a refueling charge (calculated by multiplying gallons required to refill tank with fuel to level when received, by the Pay on Return per gallon rate); and (c) Return Fuel Option - If Customer returns the Equipment with at least as much fuel as when it was received (most Sunbelt Equipment comes with a full tank of fuel, but not all), no fuel charge will be assessed. The cost of Customer refueling Equipment itself will generally be lower than the Prepay Fuel Option or the Pay on Return Option; however these options each allow for the convenience of not refueling. Customer agrees that none of these options are a retail sale of fuel.

19) **LIMITATION OF SUNBELT'S LIABILITY. IN CONSIDERATION OF THE RENTAL OF EQUIPMENT, CUSTOMER AGREES THAT SUNBELT'S LIABILITY UNDER THIS CONTRACT, INCLUDING ANY LIABILITY ARISING FROM SUNBELT'S, SUNBELT ENTITIES, OR ANY THIRD PARTY'S COMPARATIVE, CONCURRENT, CONTRIBUTORY, PASSIVE OR ACTIVE NEGLIGENCE OR THAT ARISES AS A RESULT OF ANY STRICT OR ABSOLUTE LIABILITY, SHALL NOT EXCEED THE TOTAL RENTAL CHARGES PAID BY CUSTOMER UNDER THIS CONTRACT.**

20) **JURY TRIAL WAIVER. IN ANY DISPUTE ARISING OUT OF, IN CONNECTION WITH, OR IN ANY WAY PERTAINING TO THIS CONTRACT, CUSTOMER AND SUNBELT HEREBY KNOWINGLY, VOLUNTARILY AND INTENTIONALLY WAIVE ANY RIGHT TO A TRIAL BY JURY, THIS WAIVER BEING A MATERIAL INDUCEMENT TO ENTERING INTO THIS CONTRACT.**

21) **ARBITRATION AGREEMENT & CLASS ACTION WAIVER.** AT THE ELECTION OF CUSTOMER OR SUNBELT, ANY DISPUTE ARISING OUT OF, IN CONNECTION WITH OR IN ANY WAY PERTAINING TO THIS CONTRACT SHALL BE SETTLED BY ARBITRATION BROUGHT IN THE PARTY'S INDIVIDUAL CAPACITY AND NOT AS A PLAINTIFF IN A PURPORTED CLASS OR REPRESENTATIVE CAPACITY, ADMINISTERED BY THE AMERICAN ARBITRATION ASSOCIATION UNDER ITS COMMERCIAL ARBITRATION RULES OR BY JAMS PURSUANT TO ITS STREAMLINED ARBITRATION RULES AND PROCEDURES AND JUDGEMENT ON THE AWARD RENDERED BY THE ARBITRATOR(S) MAY BE ENTERED IN ANY COURT HAVING JURISDICTION THEREOF. THERE SHALL BE NO RIGHT OR AUTHORITY FOR ANY CLAIMS TO BE ARBITRATED OR TRIED ON A CLASS ACTION BASIS.

22) **COMPLIANCE WITH EXPORT AND IMPORT LAWS.** Removal of the Equipment from the United States (U.S.) is prohibited under this Contract. If Customer desires or causes the transport and/or operation of the Equipment outside of the U.S., Customer must (a) obtain

an amendment is incorporated herein. If Customer exports or re-exports without complying with the above sentence, Customer agrees that (i) the Equipment is subject to and must comply with all applicable export laws, including but not limited to the Export Administration Regulations; and (ii) Customer, as the exporter/importer of record, is responsible for: (A) determining whether and obtaining if necessary, export or re-export licenses or other authorizations as required prior to exporting or re-exporting the Equipment; (B) obtaining any required documentation necessary for return of the Equipment; and (C) ensuring no unauthorized transfers or diversions of the Equipment occur. Refer to [www.bis.doc.gov](http://www.bis.doc.gov) for information.

23) **COLLECTION OF DATA.** Customer consents to the collection, use and disclosure of the data and information Customer voluntarily provides to Sunbelt, including personal identifiable information and financial information, as well as the Telematics Data collected from the Equipment, as described in our Privacy Policy found at [www.sunbeltrentals.com/privacypolicy](http://www.sunbeltrentals.com/privacypolicy).

24) **GOVERNING LAW.** The Parties expressly and irrevocably agree: (a) this Contract, including any related tort claims, shall be governed by the laws of South Carolina, without regard to any conflicts of law principles and (b) if any Section of this Contract is prohibited by any law, such Section shall be ineffective to the extent of such prohibition without invalidating the remaining Sections.

25) **FORCE MAJEURE.** Sunbelt shall not be liable or responsible to the Customer, nor be deemed to have defaulted under or breached this Contract, for any failure or delay in fulfilling or performing any term of this Contract when and to the extent such failure or delay is caused by or results from acts beyond Sunbelt's control, including, without limitation, the following force majeure events ("Force Majeure Events"): (i) acts of God; (ii) flood, fire, earthquake, epidemics, pandemics or explosion; (iii) war, invasion, hostilities (whether war is declared or not), terrorist attacks or acts, riot or other civil unrest; (iv) government order, law, regulations, shutdowns, or actions; (e) embargoes or blockades in effect on or after the date of this Contract; (f) national or regional emergency; (g) strikes, labor stoppages or slowdowns, or other industrial disturbances; (h) shortage of adequate power or transportation facilities; and (i) other events beyond the control of Sunbelt.

26) **MISCELLANEOUS.** This Contract, together with any Customer executed commercial credit application, if any, constitutes the entire agreement of the Parties regarding the Equipment and may not be modified except by written amendment signed by the Parties. Any reference in Customer's purchase order or other Customer document to other terms that shall control on this transaction shall be void. This Contract benefits solely the Parties and their respective permitted successors and assigns and nothing in this Contract, express or implied, confers on any other person any legal or equitable right, benefit or remedy of any nature whatsoever under or by reason of this Contract. Customer's obligations hereunder shall survive the termination of this Contract. If any term is invalid, illegal, or unenforceable, such invalidity, illegality, or unenforceability shall not affect any other term or invalidate or render unenforceable such term. This Contract and all of Customer's rights in and to the Equipment are subordinate to all rights, title and interest of all persons (including Sunbelt's lenders) who have rights in the Equipment. Headings are for convenience only. To the extent that any terms in this Contract conflict, the Parties agree that the more specific terms control. A copy of this Contract shall be valid as the original. Any failure by Sunbelt to insist upon strict performance of any Section of this Contract shall not be construed as a waiver of the right to demand strict performance in the future. Customer and the person signing this Contract agree, represent and warrant that: (a) the person executing is 18 or the legal age of majority in the state, whichever is greater and they both have full authority to execute, deliver and perform this Contract; and

(b) this Contract constitutes a legal, valid and binding obligation of Customer, enforceable in accordance with its terms. If the Parties have a fully executed, active agreement, intended to govern over conflicting terms and conditions, such agreement shall take precedence over the terms herein.

Additional terms and conditions for Shoring can be found at <https://www.sunbeltrentals.com/about/shoring-bid-no-bid-additional-terms-and-conditions/>.

Rev Date 06/16/2021

BRANCH H74  
3000 PINSON VALLEY PKWY  
BIRMINGHAM AL 35217-1810  
205-854-2048

# 230851052

**Job Site**

HELFIN TBD  
TBD HEFLIN  
HEFLIN AL 36264

**Office:** 205-836-5650

Customer # : 1276907  
Quote Date : 02/28/24  
Estimated Out : 03/04/24 12:00 PM  
Estimated In : 04/01/24 12:00 PM  
UR Job Loc : TBD HEFLIN, EDWARDSV  
UR Job # : 17  
Customer Job ID:  
P.O. # :  
Ordered By : MATT EBBERT  
Written By : LAUREN HULING  
Salesperson : QUINN O'DELL

PPM CONSULTANTS INC  
ACCTS PAYABLE  
5555 BANKHEAD HWY  
BIRMINGHAM AL 35210

**This is not an invoice  
Please do not pay from this document**

RENTAL ITEMS:							
Qty	Equipment	Description	Minimum	Day	Week	4 Week	Estimated Amt.
6	554/2020	BARRIER WALL 6' PLASTIC WATER FILL		30.00	63.00	177.00	1,062.00
Rental Subtotal:							1,062.00
SALES/MISCELLANEOUS ITEMS:							
Qty	Item		Price		Unit of Measure		Extended Amt.
1	DELIVERY CHARGE		575.000		EACH		575.00
1	PICKUP CHARGE		575.000		EACH		575.00
Sales/Misc Subtotal:							1,150.00
Agreement Subtotal:							2,212.00
Rental Protection:							159.30
Tax:							98.65
Estimated Total:							2,469.95

COMMENTS/NOTES:

CONTACT: MATT EBBERT  
CELL#: 205-919-0169  
DLV/PKU LOC SELECTED BY MAP PIN OPTION

This proposal may be withdrawn if not accepted within 30 days. The above referenced Rental Protection Plan, environmental, and tax charges are estimates and are subject to change.

NOTICE: This is not a rental agreement. The rental of equipment and any items listed above is subject to availability and subject to the terms and conditions of the Rental and Service Agreement, which are available at <https://www.unitedrentals.com/legal/rental-service-terms-US> and which are incorporated herein by reference. A COPY OF THE RENTAL AND SERVICE AGREEMENT TERMS ARE AVAILABLE IN PAPER FORM UPON REQUEST.