Quik Stop Markets, Inc.

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September 13, 2011

Mr. Paresh C. Khatri
Sr. Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Reference: Quik Stop Market #56
3132 Beaumont Avenue
Oakland, CA 94602

Subject: Additional Soil and Groundwater Investigation Workplan

Dear Mr. Khatri:

I have reviewed and approved the subject workplan. I declare, under penalty of perjury, that the information and/or recommendations contained in the workplan are true and correct, to the best of my knowledge.

Sincerely,
QUIK STOP MARKETS, INC.

Mike Karvelot
Director of Environmental Affairs

ADDITIONAL SOIL AND GROUNDWATER INVESTIGATION WORKPLAN

Quik Stop No. 56
3132 Beaumont Avenue
Oakland, California

Prepared for:
Quik Stop Markets, Inc.

Prepared by:

TRC
2300 Clayton Road, Suite 610
Concord, California

September 2011

ADDITIONAL SOIL AND GROUNDWATER INVESTIGATION WORKPLAN

Quik Stop No. 56
3132 Beaumont Avenue
Oakland, California

Prepared for:
Quik Stop Markets, Inc.

Prepared by:

Rachelle Clair, P.G.
Project Geologist

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September 12, 2011

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1.0 INTRODUCTION

On behalf of Quik Stop Markets Incorporated (Quik Stop), TRC submits this Additional Soil and Groundwater Investigation Workplan for Quik Stop Station No. 56 located at 3132 Beaumont Avenue, in Oakland, California (Figure 1). The work scope detailed in this Workplan is proposed in response to a letter request dated June 23, 2011 from the Alameda County Health Care Services, Department of Environmental Health (ACDEH), per review of the Site Conceptual Model (SCM) submitted to ACDEH in February 2011 (TRC, 2011a).

2.0 PROJECT OBJECTIVES AND SCOPE OF WORK OVERVIEW

The basic objective of this investigation is to assess the vertical extent of hydrocarbon impacts in the downgradient Site vicinity, as requested by the ACDEH in the aforementioned June 23, 2011 letter. Specifically, the drilling and sampling activities outlined in this Workplan are designed to further investigate the vertical extent of groundwater impacts and to better define the lithologies below the current known water-bearing zone in areas hydraulically downgradient of the Site where shallow groundwater impacts have been reported. TRC proposes to complete soil borings at four down- and cross-gradient locations to satisfy these project objectives.

The scope of work for this assessment includes the following:

- Advancement of four off-site direct-push soil borings to a depth of approximately 60 feet below grade (fbg).
- Collection of grab groundwater samples for analysis at a state-certified laboratory.
- Preparation of a final technical report documenting soil boring activities, groundwater sampling procedures, laboratory results, waste characterization and disposal and recommendations for future work.

3.0 SITE BACKGROUND

3.1 Site Description

The Site is currently operated as a Quik Stop Market convenience store/gasoline service station, and is surrounded by three city streets: Beaumont Avenue, 14th Avenue and East 31st Street. Most of the surrounding land use is residential, consisting of apartment and single-family buildings. The Alameda County Medical Center is located approximately 300 feet to the southwest on 14th Avenue. A Site Vicinity Map is included as Figure 1 and a Site Plan showing historical boring locations is included as Figure 2. A summary of previously completed investigations and findings at the Site is included in Section 4.0.

3.2 Geology

The Site is situated at an elevation of approximately 140 feet above mean sea level, with topography generally sloping to the southwest. The Site is located in the eastern part of the San Francisco Bay area, and is underlain by Quaternary (Pleistocene) alluvium (Muir, 1993 and Graymer, 2000). This alluvium consists of coalescing alluvial fans, and estuarine and marine deposits. These deposits are heterogeneous inter-fingering layers of clayey gravel, sandy silty clay, and various clay-silt-sand mixtures, having a maximum thickness of approximately 200 feet below grade (fbg) in the Site vicinity. Soil types immediately beneath the Site consist of stiff, dry, silty and sandy clays from the surface to a depth of approximately 13 fbg, moist or saturated

silty sand or clayey silt from approximately 13 to 25 fbg, and silty clay from approximately 25 to 33 fbg.

3.3 Hydrogeology

The Site is located in the East Bay Plain Groundwater Basin, Oakland Upland and Alluvial Plain Subarea (Muir, 1993). Regionally, shallow groundwater occurs in numerous small, discontinuous aquifers within the unconsolidated Quaternary alluvium (Godfrey, 1995), and generally flows to the southwest toward the San Francisco Bay (Alameda County Public Works Agency [ACPWA], 1999).

Observations made during the installation of the Site monitoring wells indicate that, with the exception of MW-5, saturated sediments in the vicinity of the Site are located at and below 13 fbg. Thus the monitoring wells were installed with screens set just above the top of these saturated sediments. Since the monitoring wells were installed, the depth to groundwater levels in these wells has consistently been observed at elevations 10 to 15 feet higher than where the saturated sediments were observed during the well installations. These water levels and the stiff, dry clays that were observed in the borings during drilling indicate that the groundwater at the Site is under confining conditions created by the upper clay layer. These observations are consistent with confined aquifer conditions reported for a nearby remediation site (approximately 1/5 mile northeast of the Site), at which semi-confined aquifer conditions were reported, with saturated soils present at 12 fbg and groundwater levels in wells observed at depths of 5 to 9 fbg since 2001 (CRA, 2010).

During the most recent groundwater monitoring event (June 9, 2011), groundwater flow direction was consistent with historic observations indicating a predominantly southwest gradient (e.g., 0.064 feet per foot in the northern portion of the study area, and approximately 0.025 feet per foot over the entire extent of the well network - extending to MW-6 at the southern end of the study area). South-southeastern and western components of groundwater flow are also evident at the west and east portions of the well network, respectively. The observed groundwater flow direction and gradient is attributed to local topography, with 14th Avenue (Beaumont Avenue) forming a north-south depression relative to the steeply trending perpendicular East 31st Street to the east and west. Surface topography is also generally steeper at the north end of the study area (near Site) than at the south end (near MW-6), which could explain the gentler gradient in the south relative to that in the northern portion of the study area (TRC, 2011b).

4.0 PREVIOUS INVESTIGATIONS

September 1998: Two 10,000-gallon steel gasoline USTs were excavated, removed from the Site, and replaced with two 12,000-gallon double-walled, fiberglass USTs. A small 1/8 inch diameter hole was found near the bottom of the southern end of the UST that was located closest to Beaumont Avenue (labeled UST T-2) (Garlow, 1998).

During the re-grading activities, approximately 792 cubic yards of soil were excavated to remove impacted soil and accommodate the new orientation of the USTs. Excavated soil was transported under manifest to Forward Landfill in Manteca, California for disposal (Garlow, 1998). Soil samples collected during the removal of the USTs were below laboratory reporting limits for total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethylbenzene,

and total xylenes (BTEX), and methyl tertiary-butyl ether (MTBE), except for 0.53 milligrams per kilogram (mg/kg) MTBE detected in one sample collected from the southern corner of the excavation (SW-1, near UST T-2), and 240 mg/kg TPH-g, 0.85 mg/kg ethylbenzene, and 1.3 mg/kg total xylenes in soil sample SW-2 (located near UST T-1).

According to the 1998 Underground Storage Tank Removal Report prepared by Garlow Associates (Garlow, 1998), a water line was damaged and resulted in water flowing into the excavation pit during the excavation of the USTs. Due to the presence of this water, Garlow was unable to determine the presence or absence of groundwater. Grab water samples were collected from the water accumulated at bottom of the excavation. Maximum concentrations of TPH-g and MTBE of 1,800 micrograms per liter (µg/L) and 5,500 µg/L, respectively were reported during the tank removal investigation. (Garlow, 1998).

February 2000: Three groundwater monitoring wells (MW-1, MW-2, and MW-3) were installed at the locations shown in Figure 2. Low levels of TPH-g were reported in a soil sample collected during installation of MW-1 at 6.5 fbg (2.9 mg/kg), but were not detected in other soil samples collected at that time. Low MTBE concentrations were detected in soil samples collected from MW-1 at depths ranging from 6.5 to 21.5 fbg, and from MW-3 at depths of 6 and 11 fbg. Reported MTBE concentrations in soil ranged from 0.0083 to 0.66 mg/kg. Benzene was detected at 0.038 mg/kg in one soil sample collected at 6 fbg from MW-3. Toluene and ethylbenzene were not detected in any of the soil samples. Low xylene concentrations were detected in MW-1 at 6.5 fbg (0.0097 mg/kg) and MW-3 at 6 fbg (0.019 mg/kg).

October 2006: A total of seven soil borings were completed using a cone penetration testing (CPT) rig and/or a direct push drilling rig at the following locations (Figure 2):

- B-1, B-2: Located in the middle of Beaumont Avenue just north of East 31st Street
- B-4, B-5: Located on 14th Avenue just east of the Site
- B-6: Located on the north side of 31st Street east of the Site
- B-7: Located on the south side of 31st Street east of the Site, and
- B-8: Located on 14th Avenue adjacent to Highland Hospital south of the Site.

Soil and groundwater samples were collected from each location and sent to a state-certified laboratory for analysis (TRC, 2007). Low concentrations of TPH-g (1.2 mg/kg) were detected in the soil sample collected from Boring B-4 at 8 fbg. No detectable levels of other constituents of concern were reported above applicable laboratory detection limits in soil samples collected during the October 2006 investigation. MTBE concentrations were reported in grab groundwater samples collected from six of the seven borings at a maximum level of 710 µg/L (B-2). The maximum concentration of TPH-g was reported in the grab groundwater sample collected from B-2 at 410 µg/L (TRC, 2007).

May and June 2009: Four groundwater monitoring wells (MW-4 through MW-7) were installed at the locations shown on Figure 2. Low levels of TPH-g, total petroleum hydrocarbons as diesel (TPH-d), MTBE, and Tertiary Butyl Alcohol (TBA) were detected in the soil samples collected from the borings for the monitoring wells. TPH-g and TBA were detected at a maximum of 0.25 and 0.49 mg/kg, respectively, in the soil sample collected at 5 fbg from the boring for MW-4. TPH-d was detected at a maximum of 2.6 mg/kg in the soil sample collected at 10 fbg from the boring for MW-4. MTBE was detected at a maximum concentration of 0.010 mg/kg in the soil sample collected at 15 fbg from the boring for MW-6. No other constituents of concern

(COCs) were detected in the soil samples collected from the borings for the monitoring well installations (TRC, 2009).

5.0 SITE ASSESSMENT ACTIVITIES

5.1 Pre-Field Work Activities

Underground Services Alert (USA) will be notified at least two days prior to field activities to mark underground utilities near the boring locations. Boring installation permits will be obtained from the Alameda County Public Works Agency and encroachment permits will be obtained from the City of Oakland. Prior to drilling each boring, a pilot-hole will be hand-augured to approximately 5 fbg to verify the absence of buried utilities.

A site and job specific health and safety plan that promotes personnel safety and preparedness during the planned activities has been developed and is included in Appendix A. On the morning of the day that the field activities are to commence, a "tailgate" meeting will be conducted with applicable exclusion zone workers to discuss the health and safety issues and concerns related to the specific work.

5.2 Soil Boring and Groundwater Sampling Activities

The borings will be advanced using a cone penetrometer testing (CPT) rig at the approximate locations shown on Figure 2. The borings will be advanced to an approximate depth of 60 fbg or until refusal, in an attempt to identify a second water bearing zone and, if present, to fully characterize the vertical groundwater concentration profile and maximum depth of groundwater impacts. Up to two (2) depth-discrete groundwater samples will be collected from each location using a Hydropunch sampling device. The anticipated depths that Hydropunch groundwater samples will be collected at are: 40 fbg and 60 fbg. A groundwater sample will not be collected from the upper water bearing zone (up to 20 fbg) because these boring locations are near previous boring locations where a sample has already been collected from the upper water bearing zone and where current ongoing groundwater monitoring provides coverage from nearby completed monitoring wells.

The proposed sample depths in each boring are subject to change in the field based on observed lithologies and pore pressure information obtained from the soil characterization log during the initial CPT boring at each location. The proposed boring locations may also be adjusted in the field due to aboveground features, field access considerations and/or the presence of below-ground utilities.

In order to obtain depth-discrete groundwater samples, a minimum of two (2) separate co-located borings will be advanced at each location. The first boring at each location will be advanced to total depth to determine soil behavior type using the integrated electronic cone system of the CPT rig. Lithologic and pore pressure data obtained during the initial CPT logging run will then be used to identify the specific high permeability lithologies within the upper water-bearing zone for subsequent depth-discrete Hydropunch groundwater sampling. The second boring will be advanced to collect depth-discrete groundwater samples from the target depths identified.

Depth-discrete grab groundwater samples will be collected using a disposal PVC screen. The disposal PVC will be fitted with a disposable tip and placed into the lead stainless steel drive rod, which are advanced into the water-yielding zone, then the drive rod will be withdrawn to expose the PVC screen. Groundwater will be collected from inside the screen using a clean stainless steel bailer and placed in appropriate sample bottles. If groundwater recharge at a particular target depth is slow, an attempt will be made to collect a groundwater sample by waiting a maximum of one hour for sufficient recharge to occur. Additional details regarding field sampling methodology are included in Appendix B.

The samples will be placed in an ice-chilled cooler and transported to a state-certified analytical laboratory under proper chain-of-custody protocol for analysis. The depth-discrete groundwater samples will be analyzed for the following constituents by EPA Method 8260, consistent with the analytical program routinely included in ongoing groundwater monitoring at the subject site:

- TPH-G
- BTEX
- MTBE
- Di-isopropyl ether (DIPE)
- Ethyl Tertiary Butyl Ether (ETBE)
- Tertiary Amyl Methyl Ether (TAME)
- TBA

After sampling is completed, all borings will be properly sealed with neat cement grout. A tremie pipe will be used to place the grout from the bottom of the boring to grade level in one continuous pour.

5.3 Soil and Wastewater Disposal

Soil and wastewater generated during site assessment activities will be stored onsite in Department of Transportation (DOT) approved 55-gallon drums. The waste will remain onsite until the proper method for disposal is assessed. Waste manifests will be prepared for proper transport and disposal of the waste.

5.4 Technical Report

Upon completion of the site assessment activities, a summary technical report will be prepared which will include boring logs, laboratory analytical results, findings, and conclusions. The report will be submitted to the ACDEH and the California Regional Water Quality Control Board within six weeks of the completion of field activities.

6.0 WORK SCHEDULE

Planned activities will be performed according to the following estimated completion schedule:

- Agency approval of workplan expected within six weeks of submittal.
- Conduct site assessment field activities within eight weeks of agency approval of the Workplan, assuming applicable permits (Encroachment, Drilling etc.) can be secured without unnecessary delay.

- Submit technical report within six weeks of completion of field activities.

7.0 REFERENCES

Alameda County Public Works Agency (ACPWA), 1999. Frank Codd, Personal Communication via Facsimile (map of groundwater levels in the City of Oakland area), November 16.

Conestoga-Rovers & Associates (CRA), 2010, *Revised Additional Site Characterization Report, Gatzke/Hooshi's Auto Service, 1499 Macarthur Boulevard, Oakland, California, 94602*, January 29.

Garlow Associates, 1998, *Underground Storage Tank Removal Report, Quik Stop Market No. 56, 3132 Beaumont Ave, Oakland, Ca,* November 25.

Godfrey, 1995. Andreas Godfrey, Alameda County Public Works-Water Resources Section, Personal Communication; May 22.

Graymer, R.W., 2000, *Geologic map andmap database of the Oakland metropolitan area, Alameda, Contra Costa, and San Francisco Counties, California,* U.S. Geological Survey Miscellaneous Field Studies MF-2342, Version 1.0.

Muir, Kenneth S., 1993. *Geologic Framework of the East Bay Plain Groundwater Basin, Alameda County, California*; Alameda County Flood Control and Water Conservation District, August.

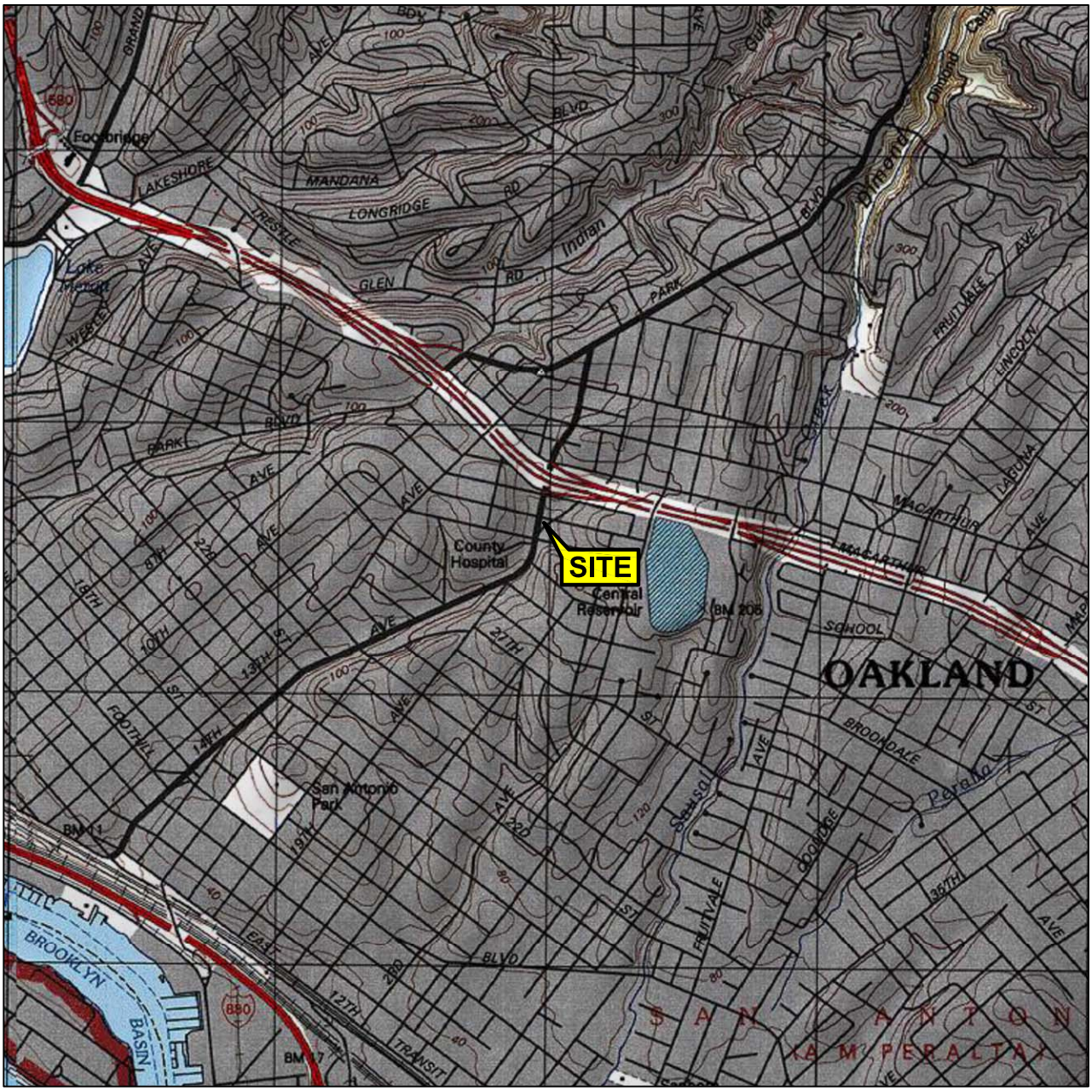
TRC, 2007. *Soil & Groundwater Investigation Report, Quik Stop No. 56, 3132 Beaumont Ave, Oakland, California,* January 15.

TRC, 2009, *Well Installation Report, Quik Stop No. 56, 3132 Beaumont Ave, Oakland, California*, August 21.

TRC, 2011a, *Site Conceptual Model, Quik Stop No. 56, 3132 Beaumont Ave, Oakland, California*, February 28

TRC, 2011b, *Semiannual Groundwater Monitoring Report, Second Quarter 2011, Quik Stop No. 56, 3132 Beaumont Ave, Oakland, California,* July 29

FIGURES



SOURCE:
United States Geological Survey
7.5 Minute Topographic Maps:
Oakland East and
Oakland West Quadrangles

VICINITY MAP

Quik Stop No. 56
3132 Beaumont Avenue
Oakland, California

TRC | 164030 | **FIGURE 1**

FILE NAME: N:\CAD\Quik Stop 56\Site Conceptual Model_Jan11\Fig1_Vicinity Map.DWG | Layout Tab: 8x11

LEGEND

- MONITORING WELL (SURVEYED)
- APPROXIMATE LOCATION OF BORING BY TRC, OCTOBER 2006
- PROPOSED BORING LOCATION

N

SCALE (FEET)

0 50 100

SOURCES: Client-provided drawings and Garlow, 1998. Revised November 2001 per well survey by Doble Thomas Associates, and August 2009 per well survey of MW-4 through MW-8 by Virgil Chavez, PLS. Aerial photo by Google Earth, October 2009.

SITE PLAN SHOWING PROPOSED BORING LOCATIONS

Quik Stop No. 56
3132 Beaumont Avenue
Oakland, California

TRC | 185996 | **FIGURE 2**

FILE NAME: Z:\Gas Stations\QUIKSTOP\Qs-56\Fig2_Proposed Boring Locations.dwg | Layout Tab: 11x17

APPENDIX A
HEALTH AND SAFETY PLAN

SITE SPECIFIC HEALTH & SAFETY PLAN

Quik Stop No. 56
Additional Soil and Groundwater Investigation
3132 Beaumont Avenue
Oakland, California

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TABLES

ATTACHMENTS

SITE SPECIFIC HEALTH AND SAFETY PLAN (HSP)

Quik Stop No. 56
Additional Soil and Groundwater Investigation
3132 Beaumont Avenue
Oakland, California

1.0 INTRODUCTION

The purpose of this Health & Safety Plan (HSP) is to establish responsibilities, procedures and contingencies for the protection of TRC employees, contractors, visitors, tenant employees, and the public while performing activities at and in the vicinity of the Quik Stop No. 56 located at 3132 Beaumont Avenue in Oakland, California. This site-specific HSP is to be implemented in conjunction with TRC Health and Safety Programs, including the Injury and Illness Prevention Program (IIPP) and Hazard Communication Program.

The use of proper health and safety procedures in accordance with applicable OSHA regulations shall be required during site work. The procedures presented in this HSP are intended to serve as guidelines. They are not a substitute for sound judgment by site personnel.

1.1 KEY COMPANIES INVOLVED IN PROJECT

CUSTOMER OR CLIENT: Quik Stop
DESIGN ENGINEER: TRC
CONTRACTORS: Gregg Drilling

A HSP will be prepared by the individual subcontractors for their activities and will be provided to supplement TRC's HSP. Copies of the subcontractor's HSPs are included in **Attachment G**.

1.2 SCOPE OF WORK

The proposed work will be performed by TRC their subcontractors will include but may not be limited to the following activities:

- Utility clearance
- Hole clearance with vacuum truck and air knife
- Drill CPT boring
- Drill borings for groundwater samples
- Collect grab groundwater samples

During the project, TRC personnel will be present for inspections and project coordination at the beginning and end of the project.

2.0 SITE INFORMATION

This HSP considers the physical, chemical, and biological hazards that may be encountered during work activities at the site. Operations associated with this HSP will be conducted in accordance with the scope of work and approved design drawings/specifications.

Summary information for this project is provided in the following table:

Table 1: Site Information

Anticipated Work Period:	December 2011
Site description (see Attachment A for site map):	Active service station and convenience store site
Approximate depth to groundwater:	Estimated to be 6 to 12 fbg
Contaminants of concern (see Attachment B):	MTBE, BTEX, constituents of gasoline

3.0 ROLES & RESPONSIBILITIES

Contact information and names of key project personnel are listed below. A description of their responsibilities follows.

Table 2: Key Project Personnel and Contact Information

Role	Name	Contact Information
TRC Personnel		
TRC Project Manager/Supervisor	Jonathan Scheiner	925-688-2473(office) 925-260-4809 (cell)
TRC Site Safety Officer (SSO)	Rachelle Clair	925-688-2464 (office) 925-260-6722 (cell)
TRC Assistant Site Safety Officer (Assistant SSO)	Kristin Bolen	925-688-2483 (office) 925-260-6157 (cell)
Contractor/Subcontractor		☐NA
☐ Contractor / ☒ Subcontractor Company Name: Gregg Drilling		
Site Safety Officer (SSO)		
Assistant Site Safety Officer (SSO)		
☐ Contractor / ☒ Subcontractor Company Name:		
Site Safety Officer (SSO)		

Assistant Site Safety Officer (SSO)		
☐ Contractor / ☒ Subcontractor Company Name:		
Site Safety Officer (SSO)		
Assistant Site Safety Officer (SSO)		
☐ Contractor / ☒ Subcontractor Company Name:		
Site Safety Officer (SSO)		
Assistant Site Safety Officer (SSO)		

TRC Site Safety Officer or Assistant Safety Officer must report all site incidents immediately to the TRC Project Manager

TRC PM/Supervisor must report all incidents INVOLVING PERSONAL INJURY immediately to:		
TRC Human Resources Manager	Regina Robertson	(916) 366-0632 - office
Sargent & Associates Contact	Bill Russell	(978) 256-7459
		(978) 256-4941 FAX

TRC PM/Supervisor must report all incidents NOT INVOLVING PERSONAL INJURY within 24 hours to:		
National Safety Director	Ron Severson	(860) 298-9692 – office

3.1 TRC Project Manager/Supervisor

- Overall responsibility for development of a complete and accurate HSP. The HSP shall account for all foreseeable hazards.
- Responsible for the management and technical direction of all aspects of the project.
- Ensure the completion of periodic site inspections.
- Conduct incident investigations.
- Delegate responsibility for field implementation of the HSP to TRC Site Safety Officer.

3.2 Site Safety Officers (SSO) – TRC & Contractor Personnel

- Contractor SSO responsible for the daily implementation of the HSP. TRC SSO will only be present for periodic inspections and planning or as needed.
- Ensures HSP is available onsite and that the plan is understood and signed by all personnel entering the site. (See **Attachment F** "Safety Compliance Agreement").
- Conducts (or coordinates the completion of) Tailgate Safety Meetings and ensures documentation of these meeting is available for review.
- Uses JSAs to emphasize hazards and protective measures discussed in the HSP.
- Communicates any revisions to the scope of work or HSP to affected personnel and Project Manager/Supervisor.

- Implements emergency response procedures.

3.3 Assistant Site Safety Officer (Asst SSO) – TRC & Contractor Personnel

- In the event the Contractor SSO is not on site, the Assistant SSO will assume the responsibilities of the SSO.
- TRC's will not typically have a SSO or Assistant SSO available onsite during work activities. They will be available by phone or pager. See "Table 2: Key Project Personnel and Contact Information".

3.4 TRC Employees

- Responsible for understanding and complying with this HSP, including the JSAs.
- Are required to participate in Tailgate Safety Meetings prior to commencement of site work.
- Must acknowledge an understanding of the HSP by signing the "Safety Compliance Agreement" (See **Attachment F**).

3.5 Contractors & Subcontractors

A copy of the HSP will be made available to each designated Contractor/Subcontractor (from now on to be referred to "Contractors") Site Health and Safety Officer (SSO) prior to coming to the site. Upon review or briefing of the HSP, each contractor and their personnel working at the site will be required to sign the "Safety Compliance Agreement" (See **Attachment F**) to verify their understanding and willingness to comply with the HSP.

TRC hires Contractors to apply their technical expertise to specific work tasks (i.e. construction, drilling, grading, and heavy equipment operation/maintenance). Although TRC has a certain level of knowledge in these areas, the contractor is most knowledgeable of the hazards within their particular area of expertise and is in the best position to implement and monitor an effective H&S program. Contractors are required to follow and operate within their company's health and safety program and policies. TRC will exercise reasonable care to prevent and detect safety violations on the site. However, direct supervision of contractor employee safety is the responsibility of the contractor.

Contractors are to designate a company representative as their own Site Safety Officer and, if applicable, Assistant Safety Officer. This individual shall monitor the contractor's employees and ensure that safe working procedures are being followed. The Site Safety Officer and, if applicable, Assistant Safety Officer shall be identified to the TRC in writing, either by email, letter or by having the individual sign and provide contact information on "Safety Compliance Agreement" (See **Attachment F**).

Contractors are to:

- Provide a copy of their HSP to the TRC SSO or Project Manager/Supervisor before work commences.
- Provide safety equipment and personal protective equipment for their employees.
- Ensure their equipment is in proper working order and their employees are trained and medically fit to complete the work assigned to them.
- Upon request, provide evidence that personnel working at the site have received the necessary training, certifications and, if applicable, medical surveillance.

The Contractor must inform the TRC SSO if the risks associated with a particular task exceed day-to-day safety requirements and necessitate additional safety precautions to protect the employees performing the particular task. In such cases, TRC may dictate that additional safety precautions be implemented. In the event a discrepancy arises between contractor safety procedures and those of TRC, the more stringent is to be implemented.

3.6 Visitors / Regulatory Agents / Tenant Employees

- Visitors / regulatory agents / tenant employees will be provided an overview of the basic site safety information. A copy of this HSP will be made available for review.
- All visitors / regulatory agents / tenant employees are required to sign-in on "Safety Compliance Agreement" (See **Attachment F**) each time they enter the project site.
- Visitors / regulatory agents / tenant employees should be escorted by a TRC or designated contractor employee and should not be allowed to move about the site alone.

4.0 COMMUNICATION

Communication is an important aspect of project safety and this HSP. There are several processes incorporated in this HSP to ensure communication of health and safety hazards.

- Pre-job Project Planning meetings to discuss the scope of work and potential hazards
- Site walkdowns with the TRC workgroup, subcontractors, and the customer/client.
- Development of site-specific HSP and JSAs.
- Communication and acknowledgement of understanding of HSP & JSAs by signing the "Safety Compliance Agreement" (See **Attachment F**)
- Tailgate meetings emphasizing that hazard assessment is a continuous process, and any potentially unsafe actions or condition are to be communicated immediately to the SSO.
- Communicating results of field observations/audits. Visual observations are to be conducted daily by the SSO. Periodic field observations will also be recorded on the TRC Field Observation Form (TRC IIPP, Appendix H). Results from either observation will be communicated during Tailgate Safety Meetings.

5.0 REVISIONS TO HSP

If a situation arises where the HSP requires revision, the following options are available:

- Except in the case of emergency situations, no deviations from the HSP may be implemented without the prior notification and approval of the TRC Site Safety Officer (SSO).
- If HSP revisions are minor (i.e. not involving significant changes to the scope of work, associated hazards or PPE requirements), the TRC Site Safety Officer (SSO) can make hand-written revisions to the HSP in the field. HSP Revisions must then be communicated to affected personnel and the Project Manager/Supervisor.
- If HSP revisions are substantial (i.e. involving significant changes to the scope of work, associated hazards or PPE requirements), the TRC Site Safety Officer (SSO) must consult

with the Project Manager/Supervisor before making revisions. The TRC Site Safety Officer (SSO) can make hand-written revisions to the HSP in the field. HSP Revisions must then be communicated to affected personnel and the Project Manager/Supervisor. It is up to the discretion of the Project Manager/Supervisor whether a revised HSP will be reissued to replace the original HSP on the work site.

6.0 HAZARD ASSESSMENT

Hazard assessment is essential for establishing hazard prevention measures. Below is a list of potential physical, chemical, and biological hazards associated with various TRC project sites. Not all hazards apply to this site-specific HSP. In addition, the list is not all-inclusive and may require additional hazards associated with a particular project/site to be added.

Please check, or add applicable hazards or hazardous tasks, hazards associated with the scope of work described in this HSP (Section 1.2). A JSA shall be developed to address each of the indicated hazards or hazardous tasks. JSAs are included in **Attachment E** of this HSP.

6.1 Physical Hazards

☐ Excavation & Trenching (where personnel will be entering the excavation)
☐ Heavy Equipment (not drilling related)
☒ Drilling
☒ Overhead lines
☒ Underground utilities
☐ Energy Control – Lock out / Tag out
☒ Flammable Atmospheres (> 10% LEL)
☒ Traffic - vehicular and pedestrian
☒ Trips, Slips & Falls
☒ Head, foot, eye, and back injuries
☐ Falling objects
☐ Working from elevated surface (> 6ft); Fall Protection / Fall Arrest
☐ Ladders Use
☒ Sharp objects

Equipment
☒ Electrical equipment (including powered hand tools)
☒ Hydraulic equipment
☒ Pneumatic equipment

Non-Powered Hand Tool
☒ Cutting equipment

☐ Welding hazards
☐ Confined Spaces

6.2 Chemical Hazards

MSDS are to be included with the HSP whenever a hazardous material (not waste) is stored or utilized at the work site. MSDSs can be found in **Attachment B** after the Occupational Health Guidelines and Toxicological Information Table.

☒ Refined Petroleum products / waste oil
☐ Asbestos
☐ Serpentine Soils
☐ PCE, TCE
☐ Ozone
☐ Hydrogen Sulfide
☐ Landfill Gases
☒ Environmental samples, soil cuttings, decontamination water, dust (nuisance, silica)

6.3 Biological Hazards

☒ Noise Exposure
☒ Heat Stress
☒ Cold Stress
☒ Weather - heat, cold, rain, fog
☐ Poisonous Plants
☐ Animals/Insects
☐ Misc. Pathogens

7.0 GENERAL SAFETY RULES

This section presents general safety rules for all persons working at the project site. Failure to follow safety protocols and/or continued negligence of health and safety policies will result in expulsion of a worker or firm from the site and may result in termination of employment.

1. Horseplay, fighting, gambling, or the possessions of firearms are not permitted.
2. Work shall be well planned and supervised to prevent injuries. Supervisors shall assure that employees observe and obey safety rules and regulations.
3. An employee reporting for work who, in the opinion of his supervisor, is unable to perform his assigned duties in a safe and reasonable manner shall not be allowed on the job.
4. No employee shall be assigned a task without first having been instructed on proper methods, including safety training, of carrying out the task. Any employee who feels they have not received proper instruction shall notify their supervisor prior to carrying out the task.
5. Injuries and accidents shall be reported immediately to the immediate supervisor, who will then report it to the SSO.
6. There shall be no consumption of food or drink in operational areas of the site. Hands should be thoroughly cleansed prior to eating.
7. Smoking is not permitted on the site.
8. When personnel are conducting hazardous operations, there shall be at least one other person (buddy system) on duty in the immediate area as a backup in case of emergency.

9. Wear required personal protective equipment (PPE) in the workplace when appropriate and/or when specified in the site-specific health & safety plan. Loose clothing and jewelry should not be worn when operating machinery.
10. Do not operate any machinery if you are not authorized or qualified to do so. If unsure how to operate a machine or perform any assigned task, ask the Project Manager/Supervisor before proceeding.
11. Do not operate motorized equipment until proper training and certification has been provided (e.g. forklifts, etc.)
12. No one shall knowingly be permitted or required to work while the employee's ability or alertness is so impaired by fatigue, illness or other causes that it might unnecessarily expose the employee or others to injury.
13. Alcohol and drugs are strictly prohibited on any TRC premises, customer property, and/or in Company vehicles. Employees shall not report to work under the influence of drugs or alcohol. Employees are prohibited from possessing, using, manufacturing, distributing, dispensing, selling, or purchasing illegal drugs or other controlled substances (as defined under federal and state law).

8.0 PERSONAL PROTECTIVE EQUIPMENT

TRC and Contractor personnel are required to wear PPE appropriate for the task and potential physical, chemical, and biological exposures. Selection of PPE is based on hazard assessment (i.e. JSAs) and air monitoring.

8.1 PPE Required by All Personnel at All Times on the Work Site

☒ Hard Hat
☒ Safety Shoes/Boots
☒ Safety Vest
☒ Eye Protection - ☒ glasses ☐ goggles ☐ face shield
☐ Hand Protection - ☐ leather ☐ nitrile ☐ other _____
☐ Hearing Protection
☐ Respiratory Protection - ☐ APR Particulate ☐ APR Chemical cartridge ☐ other _____
☐ Protective Clothing - ☐ Tyvex ☐ Nomex ☐ Coveralls ☐ other _____

8.2 PPE Should be Available at All Times on the Work Site

☐ Hard Hat
☐ Safety Shoes/Boots
☐ Safety Vest
☒ Eye Protection - ☐ glasses ☒ goggles ☐ face shield
☒ Hand Protection - ☒ leather ☒ nitrile ☐ other _____
☒ Hearing Protection
☐ Respiratory Protection - ☐ APR Particulate ☐ APR Chemical cartridge ☐ other _____
☐ Protective Clothing - ☐ Tyvex ☐ Nomex ☐ Coveralls ☐ other _____

9.0 RESPIRATORY PROTECTION

For operations that require the use of a respirator, the TRC and Contractor SSOs must verify that Field Personnel are medically approved to use respiratory equipment, fit tested, and trained in the proper use of respirators. Only respirators that are NIOSH/MSHA approved are to be used.

Respiratory protection is mandatory if workers are required to complete tasks within a hazardous atmosphere. According to OSHA, a hazardous atmosphere is defined as:

- Flammable gas, vapor, or mist in excess of 10% of LEL.
- Atmospheric oxygen is below 19.5% or above 23.5%.
- When concentration of a known contaminant is greater than the permissible exposure limit (PEL).
- Airborne combustible dust exceeds its LEL (approximated when dust obscures vision at a distance of 5 feet or less).

Air monitoring is required during all groundbreaking activities at the site to verify the presence or absence of a hazardous atmosphere due to the known high levels of PCE present in the site soil gas. Air monitoring is also to be conducted whenever a situation or condition arises that could reasonably result in a hazardous atmosphere.

9.1 Air-Purifying Particulate Respirators

Employees involved in construction and earthmoving operations that result in nuisance dust and particulates may use air-purifying respirators. These are commonly referred to as "dust masks" and do not require fit testing. Particulate respirators can be used in situations where dust and particulates are the only contaminants posing an inhalation hazard. Particulate respirators are not to be used in oxygen deficient atmosphere or if hazardous levels of gas/vapor contaminants are also present.

A high efficiency particulate air (HEPA), P100 respirator should be used in place of commercially available "dust masks".

9.2 Air-Purifying Gas/Vapor Respirators

TRC employees and Contractors are required to wear half-face, air-purifying respirators with the appropriate chemical cartridge under the following circumstances:

- When concentration of a known contaminant continuously exceeds permissible exposure limit (PEL) time-weighted average or the threshold limit value (TLV) time-weighted average.
- When volatile organic compound (VOC) vapors in the work area continuously exceed the threshold limit value- time-weighted average (TLV-TWA) for gasoline (300 parts per million [ppm]).
- When, at any time, VOC vapors in the work area exceed the threshold limit value - short-term exposure limit (TLV-STEL) for gasoline (500 ppm).
- When at any time, VOC (combined PCE and TCE) concentrations are measured at 2 ppm or greater up to 49 ppm.

See **Attachment B** for additional information and regulatory exposure limits for chemicals of concern at this site.

Air-purifying respirators (APRs) with chemical cartridges can be used under the following conditions:

- If the oxygen concentration is between 19.5% and 23.5%.
- If chemical contaminants have been identified.
- The toxic concentrations are known and the respirator cartridges are effective in removing the contaminants.
- The respirator and cartridges are NIOSH/MSHA approved.
- The contaminants have noticeable warning qualities such as odor and visibility characteristics including color.

In the event workers are required to wear air-purifying respirators (APRs) with chemical cartridges, the following requirements must be met:

- The TRC or Contractor SSO must verify that workers are:
  - Medically approved (within one year) to use respiratory protection.
  - Fit-tested for the specific respirator to be used.
  - Trained in the proper use and limitations of the respirator to be used.
- Contractors must provide proof of the above to the TRC SSO, upon request.
- If an employee or contractor has not cleared by the SSO to use a respirator, they will not be assigned tasks that may potentially expose them to contaminants.
- Personnel with interfering facial hair are not permitted to wear respirators and shall not be permitted in areas where respiratory protection is required.

According to the NIOSH guide air-supplied respirators are necessary when the concentrations of the chemicals of concern exceed the NIOSH REL. Thus air purifying respirators are not expected to be used at the job site.

9.3 Air-Supplied Respirators

Air-supplied respirators, such as SCBA or airline, full-face respiratory protection, are required when the concentrations of the contaminants of concern exceed those levels displayed in Section 10.0 Air Monitoring, Table 4, of the HSP.

In the event workers are required to wear air supplied respirators, the following requirements must be met:

- The TRC or Contractor SSO must verify that workers are:
  - Medically approved (within one year) to use respiratory protection.
  - Fit-tested for the specific respirator to be used.
  - Trained in the proper use and limitations of the respirator to be used.
- Contractors must provide proof of the above to the TRC SSO, upon request.

- If an employee or contractor is not cleared by the SSO to use a respirator, they will not be assigned tasks that may potentially expose them to contaminants.
- Personnel with interfering facial hair are not permitted to wear respirators and shall not be permitted in areas where respiratory protection is required.

10.0 AIR MONITORING

Air monitoring is required to verify the presence or absence of a hazardous gas/vapor atmosphere whenever a situation or condition arises that could reasonably result in a hazardous atmosphere.

Based on OSHA's definition of a hazardous atmosphere, there are 4 different hazards that require monitoring. The table below describes the type of hazard, what air monitoring equipment to use and what levels constitute a hazard. The information provided in the table does not take into consideration all the possible variations of hazardous atmosphere; however it will provide guidance when determining the presence of a hazardous atmosphere. Any questions or concerns should be directed to the SSO before work begins.

Table 3: Air Monitoring Guidance

Hazard	Appropriate Air Monitoring Equipment	Hazardous Levels	Comments
Flammability	Combustible gas indicators (CGI) are direct-reading instruments; measures % LEL and oxygen.	>25% of the LEL during cold work >10% of the LEL during hot work	Since many flammable vapors are heavier than air, be sure to take readings at ground level. Work is suspended if CGI readings exceed 10% of LEL.
Oxygen deficiency or abundance	Same as above or an Oxygen Meter	<19.5% and >23.5%	Concentrations >23.5% may present an increased flammability hazard.
Exceeding the permissible exposure limit (PEL)	Photo/Flame Ionization Detector (PID/FID) can detect organic and inorganic vapors/gases	Varies depending on chemical. See **Attachment B** for hazardous levels of common chemicals	It is impossible to differentiate the different chemicals using a PID meter. However, the PID will indicate whether chemicals are present and at what levels. Measurements taken within worker's breathing zone will be used to determine respiratory protection requirements.

Airborne combustible dust is not anticipated at the work site.

When conducting, air monitoring the following actions should be considered:

- Be familiar with the proper use and limitations of the air monitoring equipment to be used.

- Ensure air-monitoring equipment (TRC's or otherwise) is in working order and has been properly calibrated. The TRC SSO is to document verification of calibration (i.e. in a field log book).
- Clearly document the results of air monitoring, including:
  - Equipment name / type and calibration data
  - Date, time and site location of air monitoring (use a site map to clarify the locations of readings)
  - Indication of what is being measured (LEL, oxygen, or ppm)
  - Results of the air monitoring
- Measurements for volatile organics should be taken at low point where vapors could accumulate.
- Measurements taken to determine the need for respiratory protection should be take within the worker's "breathing zone", keeping in mind the worker's closest proximity to the hazard source.
- An individual should never enter a confined area or excavation in order to conduct initial air monitoring. Instead, actions should be taken to lower the air monitoring equipment into the area to indicate the presence (or absence) of a hazardous atmosphere. Most air monitoring equipment has audible alarms.
- In the event that CGI readings on the site exceed 10 percent of the LEL, work will be suspended until the source can be eliminated or controlled.

11.0 SITE CONTROL

The primary objective of site control is to minimize the exposure to potentially hazardous substances and/or situations. Supervision and controlling access to the work site is necessary to protect site personnel, visitors and the public.

For the purposes of this HSP, site control will be discussed under two circumstances: (1) work involving Physical Hazards and (2) work involving Chemical Hazards.

In either case, site control areas are to be clearly identified and communicated by the SSO. The hot zone must be clearly identified and should be isolated with cones, barricades, or high visibility caution tape. In addition, sufficient area also must be available to conduct operations while providing a protective buffer for persons and property outside the controlled areas.

Check which is applicable:

☒ Work involving Physical Hazards

Work does *not* involve direct contact with hazardous substances. However, if the scope of work primarily involves physical hazards (i.e. vehicular traffic, heavy equipment operation, etc.), the establishment of a warm zone is not necessary. Instead, a hot zone must be established to surround all the physical hazards. The hot zone area shall provide enough room and buffer to protect both workers and the public. A cold zone is established outside the hot zone to allow "support" activities to be conducted in a safe location.

☐ Work involving Chemical Hazards

The concept of site control and the establishment of hot/warm/cold work zones are intended for work involving the exposure (or potential exposure) to hazardous chemical concentrations. Under these circumstances, the purpose of work zones is two-fold: 1) minimize the exposure to potentially hazardous substances and 2) minimize the spread of hazardous substances outside the immediate work area through decontamination procedures.

A brief overview of site control work zones is provided below:

Hot Zone

- Where personnel may be subject to chemical or physical hazards.
- Where known or suspected contamination exists and may also be where equipment operation and/or environmental sampling will take place.
- To be clearly identified and should be isolated with cones, barricades, or high visibility caution tape.
- Large enough to provide sufficient room and buffer to protect both workers and the public.

Warm Zone

- Located between the hot and cold zones; beginning at the edge of the hot zone and extends to the cold zone.
- Utilized as a control point or corridor for persons entering or exiting the hot zone.
- Where personnel and equipment are decontaminated.

Cold Zone

- Located outside the hot zone where administrative and other support functions are located.
- Where adverse exposure to contaminants and physical hazards are unlikely.

11.1 Decontamination

The purpose of decontamination is to: (1) remove chemical containments from personnel and/or equipment and (2) significantly reduce the spread of chemical contaminants beyond the hot/warm zone.

Decontamination is intended to occur within the warm zone. Depending on the project, there may be a need to decontaminate both personnel and equipment. The decontamination process should be appropriate to the chemical hazards present. For example, refined petroleum contaminated soil on work boots/shoes may only require physical removal of the soil with a sturdy brush. However, decontamination of equipment (i.e. drilling augers) may require additional steps to ensure contaminants are not spread beyond the hot/warm zones. Heavy equipment (i.e. excavators, trucks used for waste transportation, etc.) may require a combination of steps, including the placement of gravel at the entrance/exit of the site.

11.1.1 Personnel Decontamination Procedures ☐ NA

If contaminated conditions identified by the SSO occur and PPE is required, remove contaminated items (i.e. gloves, tyvex, etc.) in an "inside out" manner. Contaminated garments are to be placed in designated plastic bags or drums prior to disposal or transfer offsite. Labels in compliance with the hazard communication standard will be affixed to containers of contaminated debris and clothing.

11.1.2 Equipment Decontamination Procedures ☐ NA

Equipment would typically become contaminated through contact with petroleum-contaminated soil. As directed by the SSO, equipment will be dry brushed to remove soil. The soil will be contained in a properly marked drum and characterized for appropriate disposal. Drilling augurs will be decontaminated by pressure washing and the water will be contained in a properly marked drum and characterized for appropriate disposal.

11.2 Site Security

Appropriate security measures will be established in coordination with the site owner/operator and communicated to site personnel. The objective of these measures is to (1) protect the public from potential exposure to physical/chemical hazards; (2) avoid public interference with personnel and safe work practices; and (3) prevent theft or vandalism of equipment at the site.

The boring locations will be surrounded by caution tape when work is in progress. The area will be left secured when unattended. All vehicles and equipment left unattended will be secured.

12.0 PERSONNEL TRAINING

TRC and Contractor personnel are required to acknowledge their understanding and willingness to comply with this HSP before admission to the site by signing the “Safety Compliance Agreement” (See **Attachment F**).

Site-specific training requirements are indicated below:

☒ Personnel shall meet the training requirements specified in the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard [29 CFR 1910.120(e) and CCR Title 8 Section 5192(e)].

☐ Kinder Morgan Contractor Safety Video.

☐ ConocoPhillips (specify type of training)

☐ ExxonMobil (specify type of training)

☐ Refinery Training:

☐ Railroad Training:
- ☐ UPPR Contractor Orientation
- ☐ BNSF Contractor Orientation
- ☐ Cal Train Contractor Orientation

☐ "FRA Roadway Worker" Training (works within 25' of track)

13.0 MEDICAL PROGRAM

TRC has established a medical surveillance program to assess, monitor, and help protect the health of employees, in particular, employees who may be exposed to potentially hazardous substances during site work. Personnel undergo medical examinations as follows:

- **Initial:** Pre-employment / prior to any assignment involving work in a hazardous or potentially hazardous environment. The initial examination is used to establish a baseline picture of health against which future changes can be measured and to identify any underlying illnesses or conditions that might be aggravated by chemical exposures or job activities. This exam also certifies whether an employee is medically fit to wear a respirator.
- **Periodic:** At least once every 12 to 24 months (depending on the employees' involvement in field activities) to measure changes in health status. This exam certifies whether an employee is still medically fit to wear a respirator.
- **Upon notification:** As soon as possible upon notification by an employee that they have developed signs or symptoms indicating possible overexposure to hazardous substances, or in response to an injury or exposure during an emergency situation.
- **Exit**: At termination of employment.

14.0 EMERGENCY RESPONSE PLAN

The TRC SSO will have controlling authority during an emergency. In the SSO's absence, the Alternate SSO will be in charge.

14.1 Evacuation Protocol

Evacuation protocol, routes, and assembly areas from the site will be established by the SSO, and communicated to Field Personnel during the Tailgate Safety Meeting(s) prior to initiating work. These designated areas are likely to change location over the course of the project. In the event of an evacuation, personnel will meet at a pre-established assembly areas and the TRC SSO conduct a "head count" to see that everyone is accounted for. Contractor SSO is responsible for being able to provide an accurate head-count of contractor personnel.

14.2 First Aid & CPR

TRC employees and Contractors with current First Aid and CPR certification and who are willing to provide First Aid and CPR will be asked to identify themselves at Tailgate Safety Meetings. Their names will be documented on the Tailgate Meeting Checklist (**Attachment F**).

14.3 Emergency Medical Assistance

A list of emergency medical assistance sources has been established as part of this HSP. **Attachment C** lists the names, locations, and telephone numbers of emergency response organizations in the vicinity of the project site, and a map to the nearest hospital(s) with an *emergency room*.

A vehicle shall be available onsite during work activities to transport injured personnel to the identified emergency medical facilities, if necessary. Company vehicles are to be equipped with a fire extinguisher and first aid kit.

14.4 Emergency Procedures

In the event of an accident, injuries, or other emergency, remember to:

- **Stop work and REMAIN CALM**
- **Move personnel to a safe location (evacuation plan)**
- **Call 911 or notify other emergency facilities, as necessary**
- **Address medical emergencies and apply first aid, if necessary**
  - Move injured or exposed person(s) from immediate area only if it is safe to do so.
  - If serious injury or life-threatening condition exists, call 911. Clearly describe the location, injury, and conditions to the dispatcher. Designate a person to direct emergency equipment to the injured person.
- **Contain physical hazards**
  - Act only if hazard is minimal and you are trained to deal with the situation. Otherwise evacuate and wait for emergency services to arrive.
- **Notify SSO and initiate incident reporting procedures**
  - See page 2 of this HSP for contact information. In the event the SSO is not available, the order of notification should be 1) Assistant SSO, 2) TRC Project Manager and 3) HR Manager (if incident involves injury) or EHS Supervisor (if incident does not involves injury).
  - TRC SSO is to notify TRC Project Manager/Supervisor as soon as reasonably possible.
- **Do not resume work until the SSO has determined it is safe to do so**

15.0 INCIDENT REPORTING

In case of an accident, TRC personnel are to immediately report the incident to their Project Manager/Supervisor and follow the TRC incident reporting procedures detailed in the TRC IIPP. TRC's incident reporting forms are available through the Project Manager/Supervisor and include:

- TRC Incident Report
- Driver's Report of Accident

- TRC Potential / Near Miss Reporting Form
- TRC Employees Report of Incident
- TRC Witness Report of Incident
- Corrective Action Form

All incidents and near misses are investigated in accordance with TRC's IIPP. The TRC Incident Report Form is to be completed and submitted to the TRC EHS Supervisor within 24 hours following any incident.

Contractor personnel are to report incidents to their SSO who is then required to report the incident to the TRC SSO, TRC Alternate SSO, or TRC Project Manager immediately. When reporting an incident, important information to include is:

1. A description of the event (including date and time)
2. Details regarding personal injury and property damage, if any.
3. Whether emergency services were notified (i.e., medical facilities, fire department, police department) and the basis for that decision. Including time and names of persons/agencies notified, and their response.
4. Clarify the need for and type of TRC support.
5. Immediate corrective action(s) taken.

16.0 HEALTH AND SAFETY PLAN (HSP) SIGNATURE PAGE

Job Safety Analysis Author	**Date:**	**HSP Author**	**Date:**
Rachelle Clair Project Geologist	9/9/11	Rachelle Clair Project Geologist	9/9/11
_____	_____	_____	_____

Review/Approvals:

Site Safety Officer **Facility/Field Supervisor**	**Date:**	**Project Manager/Supervisor***	**Date:**
Rachelle Clair		Jonathan Scheiner	
_____	_____	_____	_____
Local Safety Coordinator* ☐	**Date:**	**Western Region Safety Supervisor – Northern Area**	**Date:**
Jessica Knapp		Jessica Knapp	

_____	_____	_____	_____

Additional Information or Instructions:

_____

_____

_____

_____

* Note: **For most projects, the Project Manager/Supervisor will review, approve, and sign the HSP.** In the event the operations are beyond the normal scope of work, additional review is available upon the request from the PM/Supervisor. The Local Safety Coordinator is the first recourse for reviewing HSPs **not** involving high-risk operations. It is recommended that for HSPs involving high-risk operations (i.e. hazardous exposures to chemicals, large scale or deep excavations, confined space entry, etc.), the EHS Supervisor and/or a Safety Professional [Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP) or other professionally qualified person] be consulted for review of the HSP to ensure proper protective measures are being implemented.

ATTACHMENT A

SITE PLAN

LEGEND

- MONITORING WELL (SURVEYED)
- APPROXIMATE LOCATION OF BORING BY TRC, OCTOBER 2006
- PROPOSED BORING LOCATION

N

SCALE (FEET)

0 50 100

SOURCES: Client-provided drawings and Garlow, 1998. Revised November 2001 per well survey by Doble Thomas Associates, and August 2009 per well survey of MW-4 through MW-8 by Virgil Chavez, PLS. Aerial photo by Google Earth, October 2009.

SITE PLAN SHOWING PROPOSED BORING LOCATIONS

Quik Stop No. 56
3132 Beaumont Avenue
Oakland, California

TRC | 185996 | **FIGURE 2**

FILE NAME: Z:\Gas Stations\QUIKSTOP\Qs-56\Fig2_Proposed Boring Locations.dwg | Layout Tab: 11x17

ATTACHMENT B

OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

Table B-1

OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

Contaminant	ACGIH TLV-TWA (ppm)	NIOSH REL (ppm)	OSHA PEL (ppm)	STEL (ppm)	IDLH (ppm)	Routes of Exposure	Known or Suspected Carcinogen	Symptoms
Diesel (as Stoddard solvent)	for Diesel/ Kerosene 14.4 (skin only)	Approx. 60-98	500	250-500 (NIOSH ceiling)	Approx. 3000-5600	Inhalation, Ingestion, Contact	No	Irritation to eyes, skin, mucous membrane; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, aspiration, weakness, restlessness, in coordination
Gasoline	300	n/a	n/a	500 (ACGIH)	n/a	Inhalation, Absorption, Ingestion, Contact	Yes	Irritation to eyes, skin, mucous membrane; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, aspiration
Benzene	0.5	0.1	1	1 (NIOSH)	500	Inhalation, Absorption, Ingestion, Contact	Yes	Irritation to eyes, skin, nose, resp system, giddiness, headache, nausea, staggered gait, fatigue, anorexia, weakness/exhaustion, dermatitis
Toluene	50	100	200	150 (NIOSH)	500	Inhalation, Absorption, Ingestion, Contact	No	Irritation to eyes, nose; fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, tears, nervousness, muscle fatigue, insomnia, dermatitis
Ethyl benzene	100	100	100	125 (NIOSH& ACGIH)	800	Inhalation, Ingestion, Contact	No	Irritation to eyes, skin, mucous membranes; headache, dermatitis, narcosis, coma
Xylenes (o,m,p,)	100	100	100	150 (NIOSH & CGIH)	900	Inhalation, Absorption, Ingestion, Contact	No	Irritation to eyes, skin, nose, throat; dizziness, excitement, drowsiness, in coordination, staggering gait, nausea, vomiting, abdominal pain, dermatitis
Methyl tert butyl ether ((MTBE)	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a

TABLE KEY

ACGIH TLV-TWA	American Conference of Governmental Industrial Hygienists, Threshold Limit Value-Time Weighted Average
NIOSH REL	National Institute of Occupational Safety & Health, Recommended Exposure Limit
STEL	Short Term Exposure Limit (Gasoline STEL is by ACGIH; BTEX STELs are by NIOSH)
OSHA PEL	Occupational Safety and Health Administration, Permissible Exposure Limit
IDLH	Immediately Dangerous to Life and Health
ppm	parts per million
CNS	Central Nervous System
n/a	not available (i.e., no value has been established)

DEFINITIONS

Threshold Limit Value: Threshold limit values (TLVs) refer to airborne concentrations of substances and represent conditions under which it is believed nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

Threshold Limit Value - Time Weighted Average: The time weighted average (TWA) is a concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. TLV-TWAs are established by the ACGIH.

Recommended Exposure Limit: Unless otherwise noted, the recommended exposure limit (REL) is a TWA concentration for up to a 10-hour workday during a 40-hour workweek. RELs are established by NIOSH to reduce or eliminate adverse occupational health effects.

Short Term Exposure Limit: A short-term exposure limit (STEL) is defined as a 15-minute TWA exposure that should not be exceeded at any time during a workday. When compared to the REL (or TLV-TWA for ACGIH standards), the STEL allows the worker to be exposed to a higher concentration, BUT for a shorter period of time. Exposures above the REL up to the STEL should not be longer than 15 minutes and should not occur more than four times per day.

Permissible Exposure Limit: Permissible exposure limits (PELs) are TWA concentrations that must not be exceeded during any 8-hour work shift of a 40-hour workweek. PELs are established by OSHA (29 CFR 1910.1000).

Immediately Dangerous to Life and Health: Immediately dangerous to life and health (IDLH) values are established as concentrations from which a worker can escape within 30 minutes without suffering loss of life, irreversible health effects, or other deleterious effects that could prevent him/her from escaping the hazardous environment. The purpose of establishing an IDLH exposure concentration is to ensure that workers can escape from a given contaminated environment in the event of failure of respiratory protection equipment.

Known or Suspected Carcinogen Classification: ACGIH categories for carcinogenicity classification:

A1 – Confirmed Human Carcinogen – The agent is carcinogenic to humans based on the weight of evidence from epidemiologic studies.

A2 – Suspected Human Carcinogen – Human data are accepted as adequate in quality but are conflicting or insufficient to classify the agent as a confirmed human carcinogen; OR the agent is carcinogenic in experimental animals at dose(s), by route(s) of exposure, at site(s), of histologic type(s), or by mechanism(s) considered relevant to worker exposure. The A2 is used primarily when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals with relevance to humans.

A3 – Confirmed Animal Carcinogen with Unknown Relevance to Humans – The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) that may not be relevant to human exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.

A4 – Not Classifiable as a Human Carcinogen – Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

A5 – Not Suspected as a Human Carcinogen – The agent is not suspected to be a human carcinogen on the basis of properly conducted epidemiologic studies in humans. These studies have sufficiently long follow-up, reliable exposure histories, sufficiently high dose, or adequate statistical power to conclude that exposure to the agent does not convey a significant risk of cancer to humans; OR evidence suggesting a lack of carcingenicity in experimental animals is supported by mechanistic data.

ATTACHMENT C

EMERGENCY SERVICES
PHONE NUMBERS, DIRECTIONS, AND LOCAL AREA MAP

EMERGENCY SERVICES

FACILITY / LOCATION **TELEPHONE**

Emergency Situation.....911

TRC 24 HOUR Notification Number..... 1-800-274-9072

Hospital Name, Address, Phone, Directions:

Alameda County Medical Center.....(510) 534-8055
Highland Hospital Campus
1411 East 31st St.
Oakland, Ca

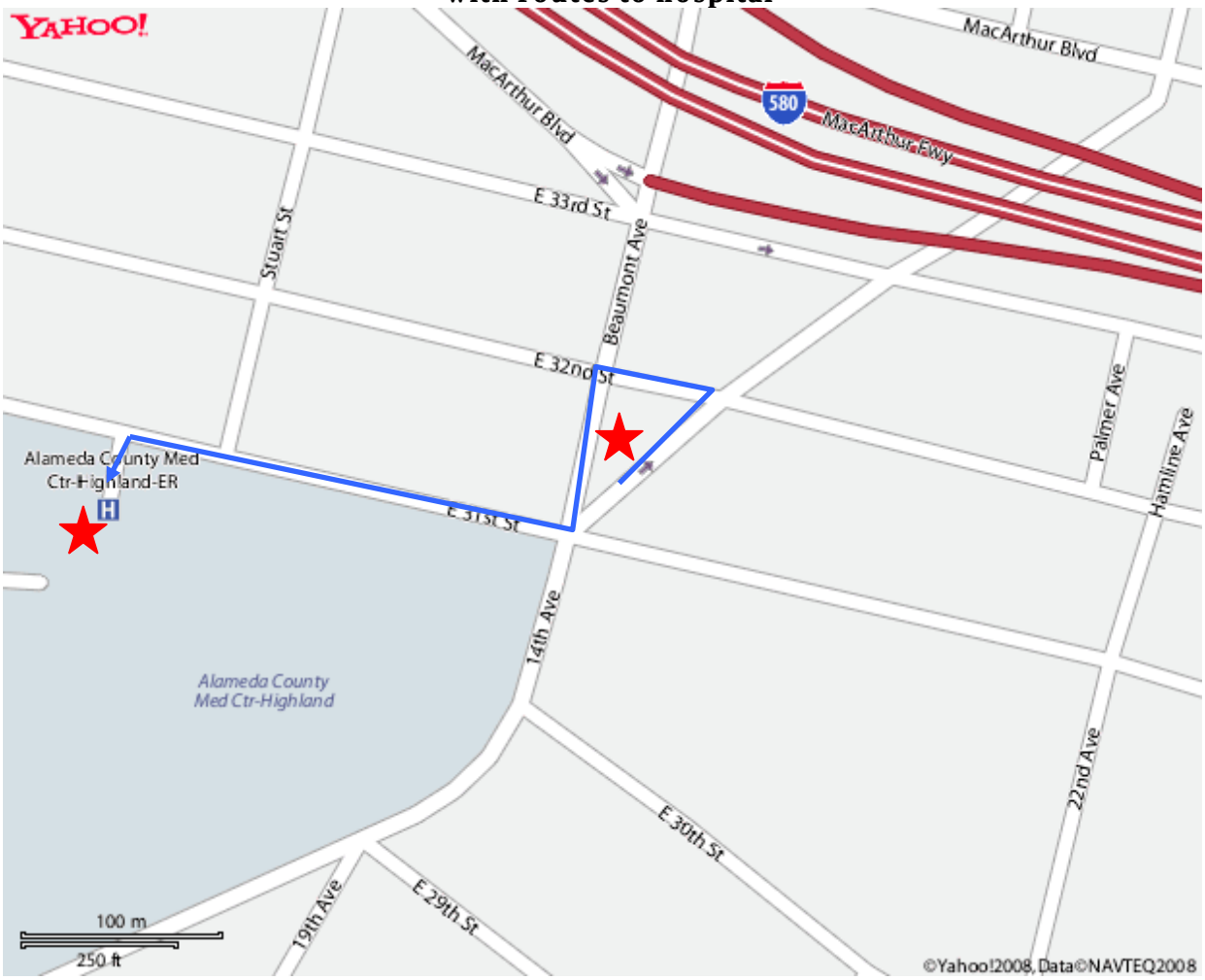
From the site, go southwest (left) on Beaumont to the next street. Turn right onto East 31st. The Emergency Room Entrance is on the left hand side. Follow the signs to the Emergency Room.

Poison Control Center: Emergency 24-Hour Hotline..... .....(800) 876-4766
California Poison Control System - San Francisco Division..... (415) 502-6000
at San Francisco General Hospital
University of California San Francisco
Box 1369
San Francisco, California 94143-1369

Office of Emergency Services: Hazardous Materials Spill Notification.....(800) 852-7550

ATTACHMENT D

LOCAL AREA MAP
with routes to hospital



ATTACHMENT E

JOB SAFETY ANALYSIS

JOB SAFETY ANALYSIS

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State)	DATE PREPARED FOR HSP:	☐ NEW ☒ REVISED from S: Drive
Quik Stop 56, 3132 Beaumont Ave Oakland, California	9/9/11	
JSA WORK ACTIVITY (Description):	List of Contractor(s) and key work activity:	
Hole Clearance	Gregg Drilling	

SITE SPECIFIC JSA AUTHOR	POSITION / TITLE	DEPT	SIGNATURE
Rachelle Clair	Project Geologist	Concord	

"TRC APPROVED" JSA DEVELOPMENT TEAM	POSITION / TITLE	APPROVAL DATE
Rachelle Clair	Concord Safety Coordinator	
Jessica Knapp	EHS Advisor	
Ron Severson	National Safety Director	

Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")

R HARD HAT R /A GLOVES Specify: ☒ leather ☒ Nitrile ☐ Other _____. R SAFETY GLASSES _____GOGGLES _____FACE SHIELD	R REFLECTIVE VEST R HEARING PROTECTION R SAFETY SHOES: Protective Toe _____ 5pt.HARNESS / LANYARD PPE CLOTHING: ____Coveralls ____Tyvek Suit ____Nomex ____Other (specify):	RESPIRATORY PROTECTION: ☐ NA _____½ face Air Purifying Respirator (APR) _____Particulate Mask: ☐ PM100 ☐ PM95 _____ Cartridge: ☒ VOC ☐ _____ _____Full face ARP; specify cartiridge type: _____ Air Supplied Respirator ____SCBA ____Air-line	Additional PPE:

Always perform a Safety Assessment: 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.

[1] JOB TASKS	[2] POTENTIAL HAZARDS	[3] HAZARD CONTROLS (beyond wearing "Required" PPE)
1. Set up Job Site	a. Physical Injury from being struck by moving vehicles or equipment.	a. Have one person watch traffic while the other creates exclusion zone in a high-use traffic area. a. Create an exclusion zone at least 10-feet beyond the limits of the hole clearance; use snow fencing, barricades, delineators, cones and/or caution tape in accordance with project specification.
2. Hole Clearance	a. Damage to underground utilities/piping b. Contact with chemical contamination c. Run-off and Soil Cross-Contamination	a. Contact TRC PM if utility/piping is encountered. b. Wear nitrile gloves when handling water or soil. Wear required PPE, including safety glasses, while on job site. c. Cover all spoils stockpiles with plastic-sheeting and berm in accordance with local and state regulations.
3. Use of Air/Water Knifes	a. Physical injury from high-pressure air/water spray	a. Never place fingers or other body parts in front of high-pressure end of air knife/water knife nozzle. a. Always follow safe working procedures outlined in equipment handbook.
Field Changes: 4.	a. b. c. d.	a. b. c. d.

[1] List all activities/steps which present a significant hazard, preferably in sequence. FOCUS ON POTENTIALLY HAZARDOUS ACTIVITIES; not the trivial ones. Apply common, yet knowable & informed, sense to identify what could reasonably be expected to cause danger.

[2] CONCENTRATE ON SIGNIFICANT HAZARDS. What can go wrong? How can someone get hurt? Can someone be struck by or strike an object?; caught on, in or between objects?; fall to ground or lower level?; experience excessive strain or stress? Be exposed to inhalation or skin hazards. Specify the hazards; be descriptive.

[3] Describe actions, procedures or limits necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable and quantified terms. Avoid subjective general statements such as, "be careful" or "use as appropriate".

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JSA WORK ACTIVITY (Description):	List of Contractor(s) and key work activity:	
Hole Clearance	Gregg Drilling	

GENERAL SAFETY HAZARDS	LOCATION(S) WHERE HAZARD IS TO BE EXPECTED	[3] HAZARD CONTROLS (beyond wearing "Required" PPE)
5. Slips, trips, and falls	a. In exclusion zone	a. Clean as you work. Put equipment away when done using it. Blot up puddles of standing water and sweep work area. a. Cover or use appropriate warning to protect all unattended open holes.
6. Cut/Pinched fingers or toes	a. Throughout work area; particularly when moving materials and during hole clearance	a. Wear leather gloves when lifting sharp or heavy equipment.
7. Strained muscles.	a. Throughout work area; particularly when moving materials and during hole clearance	a. Use proper lifting techniques; get help when moving heavy objects (>50 lbs).
8. Unauthorized Personnel in exclusion zone	a. In exclusion zone	a. Use visitor check-in log; do not allow anyone in exclusion zone without proper PPE and training documentation (HAZWOPER).
9. Flying debris	a. In exclusion zone	a. Wear ANSI-approved safety glasses working around operating equipment.
10. Loud Noise	a. In exclusion zone	a. Wear ANSI-approved hearing protection around operating equipment.
11. Explosion/Fire	a. In exclusion zone	a. No smoking or open flame. Continuously monitor ambient air concentrations with FID/LEL Meter. Shut down job and move personnel and equipment upwind if hydrocarbon concentrations are **> 50 ppm or >10% of LEL**. a. Place 2-20lb ABC Fire extinguishers in location specified by SSO. a. Follow TRC's Cell Phone Use Guidelines.

Field Notes:

LIMITATION: As part of TRC's EHS Policy, a JSA is provided by TRC for its employees. The purpose of a JSA is NOT to identify all hazards associated with a task, but to identify key potential hazards to get TRC and other onsite personnel thinking about other potential safety hazards and mitigating actions for unsafe conditions and behavior during various works. TRC recognizes that JSA's may not cover every conceivable step or hazard that emerges during a job, so we've provided a "Field Change" section below to amend a JSA if required. The JSA does not supersede or replace any local, state or federal permit, regulation, statute or other entities policies and procedures but is simply a tool for enhancing the execution of safe work at a jobsite under TRC's supervision. Similarly, all subcontractors are required to provide their own JSA(s) for their specialty prior to performing any work for TRC or its customers in accordance with TRC's EHS Policy; however, any unsafe condition or hazard not covered in any JSA is ultimately the direct responsibility of the person or entity performing the work.

[1] List all activities/steps which present a significant hazard, preferably in sequence. FOCUS ON POTENTIALLY HAZARDOUS ACTIVITIES; not the trivial ones. Apply common, yet knowable & informed, sense to identify what could reasonably be expected to cause danger.

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SITE SPECIFIC JSA AUTHOR	POSITION / TITLE	DEPT	SIGNATURE
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Rachelle Clair	Concord Safety Coordinator	
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Ron Severson	National Safety Director	

Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")

R HARD HAT R /A GLOVES Specify: ☒ leather ☒ Nitrile ☐ Other _____. R SAFETY GLASSES _____GOGGLES _____FACE SHIELD	R REFLECTIVE VEST A HEARING PROTECTION R SAFETY SHOES: Protective Toe _____ 5pt.HARNESS / LANYARD PPE CLOTHING: ____Coveralls ____Tyvek Suit ____Nomex ____Other (specify):	RESPIRATORY PROTECTION: ☐ NA ____½ face Air Purifying Respirator (APR) _____Particulate Mask: ☐ PM100 ☐ PM95 ___ Cartridge: ☒ VOC ☐ _____ _____Full face ARP; specify cartiridge type: _____ Air Supplied Respirator ____SCBA ____Air-line	Additional PPE:

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[1] JOB TASKS	[2] POTENTIAL HAZARDS	[3] HAZARD CONTROLS (beyond wearing "Required" PPE)
1. Set up Job Site	a. Physical Injury from being struck by moving vehicles or equipment.	a. Have one person watch traffic while the other creates exclusion zone in a high-use traffic area. a. Create an exclusion zone at least 10-feet beyond the limits of the boring location; use snow fencing, barricades, delineators, cones and/or caution tape in accordance with project specifications. a. Always wear safety vest, establish eye contact with operators utilizing flag men where appropriate. a. Vehicles shall use reverse beepers or flagmen.
2. Drilling	a. Contact with subsurface water, gas, electrical, and/or fiber optic lines in the vicinity of drilling locations. b. Broken wire cable or detached drill stem c. Distracted driller	a. Clear holes to 5 feet below grade with manual tools, prior to using drill rig. a. If unknown lines or obstructions are encountered, stop drilling and notify PM. Do not undermine any utilities. b. Do not stand directly in front of the drill rig while machinery is operating. Stand off to the side by driller's platform or opposite side of drill rig. c. Always communicate with the driller before approaching the operating drill stem.
Field Changes: 3.	a. b. c. d.	a. b. c. d.

[1] List all activities/steps which present a significant hazard, preferably in sequence. FOCUS ON POTENTIALLY HAZARDOUS ACTIVITIES; not the trivial ones. Apply common, yet knowledgeable & informed, sense to identify what could reasonably be expected to cause danger.

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JOB SAFETY ANALYSIS

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5. Slips, trips, and falls	a. In exclusion zone	a. Clean as you work. Put equipment away when done using it. Blot up puddles of standing water and sweep work area. a. Cover or use appropriate warning to protect all unattended open holes.
6. Cut/Pinched fingers or toes	a. Throughout work area; particularly when moving materials.	a. Wear leather gloves when lifting sharp or heavy equipment.
7. Strained muscles.	a. Throughout work area; particularly when moving augers	a. Use proper lifting techniques; get help when moving heavy objects (>50 lbs).
8. Unauthorized Personnel in exclusion zone	a. In exclusion zone	a. Use visitor check-in log; do not allow anyone in exclusion zone without proper PPE and training documentation. (HAZWOPER).
9. Flying debris	a. In exclusion zone	a. Wear ANSI-approved safety glasses working around operating equipment.
10. Loud Noise	a. In exclusion zone	a. Wear ANSI-approved hearing protection around operating equipment.
11. Explosion/Fire	a. In exclusion zone	a. No smoking or open flame. Continuously monitor ambient air concentrations with FID/LEL Meter. Shut down job and move personnel and equipment upwind if hydrocarbon concentrations are **>50 ppm or >10% of LEL.** a. Place 2-20lb ABC Fire extinguishers in location specified by SSO. a. Follow TRC's Cell Phone Use Guidelines.
12. Exposure to hydrocarbon impacted soil or groundwater	a. In exclusion zone	a. Wear nitrile gloves during handling of soil or groundwater.
13. Soil and groundwater cross-contamination	a. In exclusion zone	a. Identify and delineate soil stockpile area or storage area of drummed soil cuttings/decontamination water.

Field Notes:

LIMITATION: As part of TRC's EHS Policy, a JSA is provided by TRC for its employees. The purpose of a JSA is NOT to identify all hazards associated with a task, but to identify key potential hazards to get TRC and other onsite personnel thinking about other potential safety hazards and mitigating actions for unsafe conditions and behavior during various works. TRC recognizes that JSA's may not cover every conceivable step or hazard that emerges during a job, so we've provided a "Field Change" section below to amend a JSA if required. The JSA does not supersede or replace any local, state or federal permit, regulation, statute or other entities policies and procedures but is simply a tool for enhancing the execution of safe work at a jobsite under TRC's supervision. Similarly, all subcontractors are required to provide their own JSA(s) for their specialty prior to performing any work for TRC or its customers in accordance with TRC's EHS Policy; however, any unsafe condition or hazard not covered in any JSA is ultimately the direct responsibility of the person or entity performing the work.

[1] List all activities/steps which present a significant hazard, preferably in sequence. FOCUS ON POTENTIALLY HAZARDOUS ACTIVITIES; not the trivial ones. Apply common, yet knowledgeable & informed, sense to identify what could reasonably be expected to cause danger.

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ATTACHMENT F

TAILGATE SAFETY MEETING CHECKLIST

AND

HSP COMPLIANCE AGREEMENT

TAILGATE SAFETY MEETING CHECKLIST

Date / Time of Tailgate Meeting: _____

- ☐ **Vehicle Inspection:** Driver will perform Driver's Daily Vehicle Inspection Checklist before leaving the yard or if changing drivers during the day.
- ☐ **Personnel training/qualifications:** Check cards for OSHA HAZWOPER 40-hour certification/8-hour-refresher training (or any other specialized training to perform the task if appropriate). TRC personnel have been trained on the Company's Drug and Alcohol Policy and will inform all site personnel.
- ☐ **Supplies:** Indicate location of first aid kit, fire extinguisher, clean water supply (drinking, eyewash), and Site Health and Safety Plan (HSP).
- ☐ **Emergency services:** Discuss location of nearest telephone and directions to hospital. Map, directions, phone numbers are provided in the HSP (Attachment C).
  The TRC Emergency 24 Hour Number is 1-800-274-0972.
  - **First-Aid/CPR volunteers:** _____
- ☐ **Site background:** Discuss types, locations, and concentrations of chemicals found onsite, presence of free product, depth to groundwater, etc.
- ☐ **Offsite Permits/Access Permits:** Discuss any permitting requirements for the site.

Work activities: Discuss scope of work for the day and activities to be performed.

- ☐ **Potential hazards: Review JSAs.** Discuss physical, chemical, and biological hazards. Discuss the prohibiting of any eating, drinking, and/or smoking in the work zone.
- ☐ **Personal protective equipment (PPE):** Discuss required level of protection; review additional PPE requirements in JSAs, as needed.

  ☒ Hard Hat ☒ Safety Shoes/Boots ☒ Safety Vest
  ☒ Eye Protection - ☒ glasses ☐ goggles ☐ face shield
  ☐ Hand Protection - ☐ leather ☐ nitrile ☐ other _____
  ☐ Hearing Protection
  ☐ Respiratory Protection - ☐ APR Particulate ☐ APR Chemical cartridge
  ☐ Other _____
  ☐ Protective Clothing - ☐ Tyvex ☐ Nomex ☐ Coveralls ☐ other _____
- ☐ **Utilities:** Utilities have been cleared/marked by appropriate divisions.
- ☐ **Traffic control** (vehicular and pedestrian): Work area is properly delineated and cordoned off from traffic. Technician will put a traffic cone at all four corners of his parked vehicle. Upon completion of work, walk around vehicle to pick up cones and check all four sides and underneath vehicle for obstacles prior to moving truck.
- ☐ **Dispenser Emergency Shut-off Switch:** Location has been identified/communicated with field personnel.
- ☐ **Dealer Notification:** Notify dealer/owner of site work activities to be performed.

HSP COMPLIANCE AGREEMENT

By signing below, I have completed the Tailgate Safety Meeting Checklist, reviewed this Site Health and Safety Plan and the Job Safety Analysis (JSA), and understand their contents. I hereby agree to comply with all safety requirements outlined herein:

TRC

Signature: _____, Site Safety Officer (SSO)

Print Name: _____ Date: _____

Signature: _____, Asst. Site Safety Officer (Asst. SSO)

Print Name: _____ Date: _____

Contractor: Pacific States Environmental Contractors, Inc. (Pacific States)

Signature: _____, Site Safety Officer (SSO)

Print Name: _____ Date: _____

Signature: _____, Asst. Site Safety Officer (Asst. SSO)

Print Name: _____ Date: _____

Contractor: Construction Materials Testing, Inc. (CMT)

Signature: _____, Site Safety Officer (SSO)

Print Name: _____ Date: _____

Signature: _____, Asst. Site Safety Officer (Asst. SSO)

Print Name: _____ Date: _____

TRC Employees / Contractor Personnel / Visitors

Signature: _____ Date: _____

Print Name: _____Company: _____

Signature: _____ Date: _____

Print Name: _____Company: _____

HSP COMPLIANCE AGREEMENT (cont.)

By signing below, I have completed the Tailgate Safety Meeting Checklist, reviewed this Site Health and Safety Plan and the Job Safety Analysis (JSA), and understand their contents. I hereby agree to comply with all safety requirements outlined herein:

TRC Employees / Contractor Personnel / Visitors (cont.)

Signature: _____ Date: _____

Print Name: _____Company: _____

Signature: _____ Date: _____

Print Name: _____Company: _____

Signature: _____ Date: _____

Print Name: _____Company: _____

Signature: _____ Date: _____

Print Name: _____Company: _____

Signature: _____ Date: _____

Print Name: _____Company: _____

Signature: _____ Date: _____

Print Name: _____Company: _____

Signature: _____ Date: _____

Print Name: _____Company: _____

Signature: _____ Date: _____

Print Name: _____Company: _____

Signature: _____ Date: _____

Print Name: _____Company: _____

APPENDIX B
GENERAL FIELD PROCEDURES

GENERAL FIELD PROCEDURES

A description of the general field procedures used during site investigation and monitoring activities is presented below. For an overview of protocol, refer to the appropriate section(s).

DRILLING AND SOIL SAMPLING

Soil borings are drilled using continuous-flight, hollow-stem augers. Borings that are not completed as monitoring wells are grouted to within 5 feet of the ground surface with a cement/bentonite slurry. The remaining 5 feet is filled with concrete.

Soil samples are obtained for soil description, field hydrocarbon vapor screening, and possible laboratory analysis. Soil samples are retrieved from the borings by one of two methods: 1) continuously, using a 5-foot-long, continuous-core barrel sampler advanced into the soil with the lead auger; sample tubes are driven into the core with a mallet, or 2) at 2.5- or 5-foot intervals, using a standard split-spoon sampler lined with four 1.5-inch-diameter stainless steel or brass sample inserts. The split-spoon sampler is driven approximately 18 inches beyond the lead auger with a 140-pound hammer dropped from a height of 30 inches.

For hand auger borings and hand-held, power-driven auger borings, soil samples are retrieved using a hand-driven slide hammer lined with a 1.5-inch-diameter stainless steel sample tube.

During drilling activities, soil adjacent to the laboratory sample is screened for combustible vapors using a combustible gas indicator (CGI) or equivalent field instrument. For each hydrocarbon vapor screening event, a 6-inch-long by 2.5-inch-diameter sample insert is filled approximately 1/3 full with the soil sample, capped at both ends, and shaken. The probe is then inserted through a small opening in the cap, and a reading is taken after approximately 15 seconds and recorded on the boring log. The remaining soil recovered is removed from the sample insert or sampler, and described in accordance with the Unified Soil Classification System. For each sampling interval, field estimates of soil type, density/consistency, moisture, color, and grading are recorded on the boring logs.

SOIL SAMPLE HANDLING

Upon retrieval, soil samples are immediately removed from the sampler, sealed with Teflon sheeting and polyurethane caps, and wrapped with tape. Each sample is labeled with the project number, boring/well number, sample depth, geologist's initials, and date of collection. After the samples have been labeled and documented in the chain of custody record, they are placed in a cooler with ice at approximately 4 degrees Celsius ($^{\circ}$C) prior to and during transport to a state-certified laboratory for analysis. Samples not selected for immediate analysis may be transported in a cooler with ice and archived in a frostless refrigerator at approximately 4°C for possible future testing.

MONITORING WELL INSTALLATION

Monitoring wells are constructed of 4-inch-diameter, flush-threaded Schedule 40 PVC blank and screened (0.020-inch slot size) casing. Where possible, the screened interval will extend at least 10 feet above, and 10 to 20 feet below, the top of the groundwater table. The annular space surrounding the screened casing is backfilled with No. 3 Monterey sand (filter pack) to approximately 2 feet above the top of the screened section.

During well construction, the filter pack is completed by surging with a rig-mounted surge block. A 3-foot-thick bentonite annular seal is placed above the filter pack. The remaining annular space is grouted with Portland cement and/or bentonite grout to the surface. Utility access boxes are installed slightly above grade. Locking, watertight caps are installed to prevent unauthorized access to the well, and limit infiltration of surface fluids.

FLUID LEVEL MONITORING

Fluid levels are monitored in the wells using an electronic interface probe with conductance sensors. The presence of liquid-phase hydrocarbons is verified using a hydrocarbon-reactive paste. The depth to liquid-phase hydrocarbons and water is measured relative to the well box top or top of casing. Well boxes or casing elevations are surveyed to within 0.02 foot relative to a county or city bench mark.

GROUNDWATER PURGING AND SAMPLING

Groundwater monitoring wells are purged and sampled in accordance with standard regulatory protocol. Typically, monitoring wells that contain no liquid-phase hydrocarbons are purged of groundwater prior to sampling so that fluids sampled are representative of fluids within the formation. Temperature, pH, and specific conductance are typically measured after each well casing volume has been removed. Purging is considered complete when these parameters vary less than 10% from the previous readings, or when four casing volumes of fluid have been removed. Samples are collected without further purging if the well does not recharge within 2 hours to 80% of its volume before purging.

The purged water is either pumped directly into a licensed vacuum truck or temporarily stored in labeled drums prior to transport to an appropriate treatment or recycling facility. If an automatic recovery system (ARS) is operating at the site, purged water may be pumped into the ARS for treatment.

Groundwater samples are collected by lowering a 1.5-inch-diameter, bottom-fill, disposable polyethylene bailer just below the static water level in the well. The samples are carefully transferred from the check-valve-equipped bailer to 1-liter and 40-milliliter glass containers. The sample containers are filled to zero headspace and fitted with Teflon-sealed caps. Each sample is labeled with the project number, well number, sample date, and sampler's initials. Samples remain chilled at approximately 4°C prior to analysis by a state-certified laboratory.

CHAIN OF CUSTODY PROTOCOL

Chain of custody protocol is followed for all soil and groundwater samples selected for laboratory analysis. The chain of custody form(s) accompanies the samples from the sampling locality to the laboratory, providing a continuous record of possession prior to analysis.

DECONTAMINATION

Drilling and Soil Sampling

Drilling equipment is decontaminated by steam cleaning before being brought onsite. The augers are also steam cleaned before each new boring is commenced. Prior to use, the sampler and sampling tubes are brush-scrubbed in a Liqui-nox and potable water solution and rinsed

twice in clean potable water. Sampling equipment and tubes are also decontaminated before each sample is collected to avoid cross-contamination between borings.

Groundwater Sampling

Purging and sampling equipment that could contact well fluids is either dedicated to a particular well or cleaned prior to each use in a Liqui-nox solution followed by two tap water rinses.