THRIFTY OIL CO.

January 5, 2011 O-1174

City of Los Angeles Fire Department
Environmental Unit- Underground Storage Tanks
Attn: Eloy Luna, Engineering Geologist Associate IV
221 North Figueroa Street, Suite 1500
Los Angeles, CA 90012

RE: **Former Thrifty Station No. 020 (ARCO #9517)**
10801 Santa Monica Boulevard
Los Angeles, California 90025

Subject: **Site Assessment Report & Proposed Remedial Action**

Dear Mr. Luna:

Enclosed, please find a copy of the *Site Assessment Report* (SAR), dated December 30, 2010, and prepared by Wayne Perry , Inc. (Wayne Perry) (**Attachment A**) for Thrifty Oil Co. (Thrifty) Station No. 020, located at 10801 Santa Monica Boulevard, Los Angeles, California (**Figure 1**). The SAR summarizes the site assessment activities conducted at the site on November 16 through 18, 2010, and proposes a 36-hour continuous mobile high vacuum dual-phase extraction (HVDPE) event using the newly installed wells SB-1, SB-2S and SB-2D as extraction point. The site assessment activities were conducted in response to the City of Los Angeles Fire Department (LAFD) letter, dated June 9, 2010.

Thrifty will implement the HVDPE event upon approval from the LAFD.

Should you have any questions regarding the enclosed documents, please contact Simon Tregurtha at (562) 921-3581 Ext. 260, or Chris at Ext. 390.

Sincerely,

Simon Tregurtha
Project Manager

Chris Panaitescu
General Manager
Environmental Affairs

cc: BP West Coast Products LLC, Mr. John Skance
File

13116 Imperial Hwy, Santa Fe Springs, CA 90670-0138 • Ph: (562)921-3581

REQUIRED INFORMATION FORM

INSTRUCTIONS: This form is to be filled out completely and must be the first page of any document, including all reports, submitted to the Los Angeles Fire Department (LAFD) Underground Storage Tank Unit (UST). To ensure accuracy this form must be completed on the computer or typed out. **Hand printing or writing will not be accepted.** The correct LAFD **Facility I.D. No.** and **Division 5 Permit No.** must be included for the submittal to be processed.
**** (SOME INFORMATION MAY ALREADY BE PRE-ENTERED FOR YOUR CONVENIENCE)**

PLEASE NOTE THAT AN ACCOMPANYING INTRODUCTORY LETTER ON YOUR COMPANY LETTERHEAD CANNOT BE SUBSTITUTED FOR THIS FORM.

Today's Date: 1/5/2011

Mail to: City of Los Angeles Fire Department
Environmental Unit – Underground Storage Tanks
Attn: Eloy Luna, Engineering Geologist Associate IV
221 North Figueroa Street, Suite 1500
Los Angeles, CA., 90012

Report Title
(Please select the applicable title from the drop down menu)

Site Assessment Report & Proposed Remedial Action

LAFD Facility I.D. No. 26137

LAFD Division 5 Permit No.
LAFD Site Assessment Permit No. 24288

Site/Facility Name: Former Thrifty Oil Station No. 020

Site Address: 10801 Sant Monica Blvd. **City/State/Zip: Los Angeles, CA,**

Site Facility Description: Former Thrifty Oil Station No. 020

Tank Owner/Tank Operator/Responsible Party Contact Information

Contact Name and Title:
Simon Tregurtha / Project Geologist

Contact Phone No.
(562) 921-3581 Ext. 260
Company Name:
Thrifty Oil Co.
Company Address:
13116 Imperial Highway
City/State/Zip: Los Angeles, CA,
Santa Fe Springs, CA 90670

Consultant Information

Contact Name and Title:
Simon Tregurtha / Project Geologist

Contact Phone No.
(562) 921-3581 Ext. 260
Company Name:
Thrifty Oil Co.
Company Address:
13116 Imperial Highway
City/State/Zip: Los Angeles, CA,
Santa Fe Springs, CA 90670

SITE ASSESSMENT REPORT

THRIFTY OIL CO STATION NO. 020
10801 SANTA MONICA BOULEVARD
LOS ANGELES, CALIFORNIA 90025

December 30, 2010

SUBMITTED TO:

Thrifty Oil Co.
13116 Imperial Highway
Santa Fe Springs, California 90670
Attention: Mr. Chris Panaitescu

PREPARED BY:

WAYNE PERRY, INC.
8281 Commonwealth Avenue
Buena Park, California 90621
(714) 826-0352

LOS ANGELES FIRE DEPT. FACILITY ID: 26137
PERMIT NO. 24288
WPI PROJECT: 10.184

WARRANTY STATEMENT

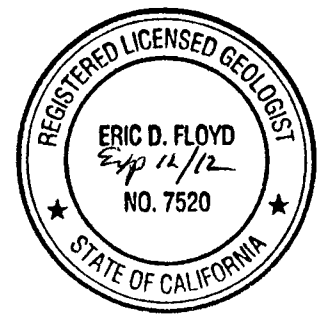
This Site Assessment Report has been prepared by Wayne Perry, Inc. (WPI) for the exclusive use of Thrifty Oil Co., as it pertains to Thrifty Oil Co Station No. 020 located at 10801 Santa Monica Boulevard, California. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by other geologists, hydrogeologists, and engineers practicing in this field. No other warranty, express or implied, is made as to the professional advice in this report.

Should you have questions or require additional information, please contact Eric Floyd at (714) 826-0352.

PREPARED BY:

Kristine Wulff
Staff Scientist

Eric Floyd
California Professional Geologist 7520



December 30, 2010

WPI PROJECT NO. 10.184

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1.0 INTRODUCTION

In correspondence dated June 9, 2010, the Los Angeles Fire Department (LAFD) requested that additional assessment activities be conducted at Thrifty Station No. 020 located at 10801 Santa Monica Boulevard in Los Angeles, California (herein referred to as the "Site")to define the distribution of impacted soils, and submittal of a remedial action plan (RAP). The *Site Assessment Workplan and Remedial Action Plan* dated August 3, 2010 proposed the installation of three soil borings advanced to delineate the vertical extent of contaminants. If contaminant concentrations detected in soil samples were equal to or greater than those detected by previous investigations, the borings would be converted to vapor extraction wells. The workplan also specified that if detected concentrations were consistent with previous investigation results (both depths and concentrations), the threat to groundwater quality would be considered minimal, and interim remedial actions (IRA) by soil vapor extraction would be used to eliminate any potential impact to groundwater.

This report documents boring / well installation and sampling procedures, and discusses results obtained from the laboratory analysis of soil samples. Conclusions and recommendations based on these and data from previous investigations are also discussed.

2.0 BACKGROUND

2.1 Site Description

The Site is a retail gasoline sales facility that is owned by Thrifty and has been operated by ARCO Products Co. since April 22, 1997. The Site is located at the northwest corner of Santa Monica Boulevard and Malcolm Avenue in Los Angeles, California, at an approximate elevation is 255 feet above mean sea level. Local topography slopes gently to the southwest (USGS, 1966).

Residential properties are located north of the site. An Enterprise Rental Car is located east of the site, across Malcolm Avenue. South of the site, is Santa Monica Boulevard followed by a mix of commercial and multi-family residential. A motel is located adjacent to the site on the west. A site vicinity map is included as Figure 2.

Improvements on site include a double contained underground storage tank (UST) system consisting of two 20,000-gallon USTs (one of which is divided into two 10,000-gallon sections) containing gasoline, and associated product piping. The UST system was installed in October 1997. Additional features of the Site include three dispenser islands under a canopy and a kiosk. Main features of the Site are shown on the plot plan provided as Figure 3. Thrifty does not currently have any plans to alter the use of the property.

2.2 Site History

Date	Activity/Method	No. of Wells, Borings or Samples	Report Date	Consultant	Comments
6/97 & 7/97	Baselining Subsurface Investigation Report	7 Soil Borings (TDD-1 through TDD-7)	12/22/97	Pacific Environmental Group, Inc.	Total petroleum hydrocarbons as gasoline (TPH-G), benzene, and methyl tert butyl ether (MTBE) were detected in the soil samples at maximum concentrations of 1,200 mg/kg, 2,300 µg/kg, and 22,000 µg/kg, respectively, in the samples from TDD-5-15'.
10/97	UST Replacement Activities	Soil Samples	4/10/98	Tait Environmental Services	Four USTs were removed and replaced with two double walled USTs. TPH-G, total petroleum hydrocarbons as diesel (TPH-D), benzene and MTBE were detected in soil samples collected from beneath the USTs, the side walls and beneath the product piping at maximum concentrations of 19,000 mg/kg, 890 mg/kg, 30,000 µg/kg, and 270, 000 µg/kg, respectively. Approximately 1,278 tons of hydrocarbon-impacted soil was excavated and removed from the Site.
9/07	Agency Correspondence	--	9/18/07	LAFD	In response to the 4/10/98 report, LAFD requested that a workplan for additional site assessment be submitted.
9/08	Workplan for Site Assessment	--	9/8/08	Thrifty	Thrifty proposed installation of three soil borings. The borings would be converted to wells if groundwater was encountered.
12/08	Agency Correspondence	--	12/12/08	LAFD	LAFD approved the 9/8/08 workplan.

Date	Activity/Method	No. of Wells, Borings or Samples	Report Date	Consultant	Comments
3/09	Additional Site Assessment Report and Request for Closure	4 Soil Borings (B-8 through B-11)	3/11/09	GeoHydrologic Consultants Inc. (GHC)	TPH-G, TPH-D, benzene, MTBE and TBA were detected in soil samples at maximum concentrations of 1,400 mg/kg, 1,090 mg/kg, 3.8j µg/kg, 4.7 mg/kg , and 4.02 mg/kg, respectively. Groundwater was not encountered. GHC concluded that the lateral and vertical extent of contamination was defined and closure was requested.
6/10	Agency Correspondence	--	6/9/10	LAFD	LAFD denied the request for closure and requested additional assessment in the area of boring B-8 and the dispenser islands. LAFD also requested submittal of a RAP.
8/10	Additional Site Assessment Workplan and Remedial Action Plan	--	8/3/10	WPI	Three soil borings were proposed. If contaminant concentrations detected in soil samples were equal to or greater than those detected by previous investigations, the borings would be converted to vapor extraction wells. If detected concentrations were consistent with previous investigation results (both depths and concentrations), IRA by soil vapor extraction would be used.

Historical soil analytical data are provided in Appendix A.

2.3 Geology

The Site is located on the Hollywood Piedmont Slope, and is underlain by Holocene-age alluvium, followed by Pleistocene-age deposits of the Lakewood Formation (CDWR, 1961). Soil types encountered beneath the Site during previous site assessment activities consisted predominantly of silty, clayey sand from the ground surface to depths of 30 feet beneath ground surface (bgs) underlain by predominantly silty sand to a depth of approximately 55 feet bgs. From 55 feet to 65 feet bgs, the soil type consisted of clayey sand with gravel. Below a depth of 65 feet, the majority of sediments encountered consisted of sandy silt and silt, with lesser

amounts of lean clay and silty sand, to a total depth of 90 feet bgs, the maximum depth explored. Geologic cross sections are provided as Figures 4 through 6.

2.4 Hydrogeology

The site is located within the Santa Monica Sub-basin of the Central Groundwater Basin of the Los Angeles – San Gabriel Hydrologic Unit (CRWQCB-LAR, 1994). The regional Ballona Aquifer (groundwater expected at 70 to 80 feet bgs) occurs within the Lakewood Formation deposits (CDWR, 1961). Groundwater was encountered at the nearby Exxon Mobil Oil Corporation Service Station, located at 10857 Santa Monica Blvd. (430 feet southwest of the site), at a depth of approximately 118 feet during the March 2010 groundwater monitoring event. Based on the local topographic gradient of the area, groundwater is expected to flow toward the southwest. Historically, groundwater has not been encountered beneath the Site to a total depth of 90 feet (the maximum depth explored). However, during this investigation, soils at or near saturation were encountered at depths of about 55 to 59 feet (drilling of SB-2 and SB-3). The existence of water at these locations and depths appears to be due to perched conditions, as the sandy layer where groundwater was encountered is underlain by finer grained sediments at both locations. Although indications of moisture were observed at SB-1, there was no indication of saturated soils, suggesting that the observed water bearing sediments are localized and of limited extent.

2.5 Potential Sensitive Receptors

According to the Los Angeles Department of Public Works, Water Resources Department, there are no active wells within a 1-mile radius of the site (DPW, 2010). However, there are six schools / child care centers within a 1/2-mile radius of the site (Google Earth, 2010). These are listed below.

Summary of Potential Sensitive Receptors

Facility/Sensitive Receptor	Distance from Site (feet)	Direction from Site
Emerson Middle School	415	Northeast
Global Montessori School of Westwood	940	Southwest
Westwood Charter School	1,100	Southeast
Chalk Preschool	1,305	South
Pacific Western University	1,370	Northwest
Creative Center for Children	2,600	Northeast

The locations of these schools / child care centers are shown on Figure 1.

3.0 HYDROCARBON DISTRIBUTION

3.1 Soil

In January 2009 four soil boring (B-8 through B-11) were advanced to depths ranging from 85 to 95 feet bgs. Soil samples were collected at 5-foot intervals, and (according to laboratory analytical results) only minor to trace hydrocarbon concentrations were detected in borings B-9, B-10, and B-11. Hydrocarbon concentrations detected in boring B-8 were significantly higher.

Elevated TPH-G concentrations (>1,000 mg/kg) were limited to boring B-8 at depths between 30 to 40 feet. TPH-D concentrations greater than 10 mg/kg were only detected in boring B-8 up to 45 feet and B-11 up to 40 feet. Benzene was only detected at trace levels in borings B-9 (30 feet) and B-11 (25 and 30 feet). MTBE was detected at concentrations greater than 1,000 µg/kg between 35 and 50 feet in boring B-8, at 45 feet in boring B-9, and at 40 feet in boring B-11. TBA was detected at concentrations greater than 1,000 µg/kg at 20 and 25 feet in boring B-8, from 60 to 75 feet in B-9, and from 10 to 25 feet and 45 to 50 feet in B-11.

Soil analytical data are summarized in Table 1. Isoconcentration plots showing the distribution of hydrocarbons in soil are provided as Figures 5 through 8. Groundwater was not encountered during the investigation to the maximum depth drilled of 95 feet.

Based on previous investigations, it appears that the maximum soil concentrations are limited to the 25 to 45 foot interval for TPH-G / benzene, toluene, ethylbenzene and xylenes (BTEX), and 25 to 55 feet for MTBE. Below these depths, the concentrations were either non-detect or at low levels, which should not pose a significant threat to the groundwater quality.

4.0 SITE INVESTIGATION ACTIVITIES

The LAFD required additional site assessment to further define the vertical and lateral extent of petroleum hydrocarbons in soils underlying the site, specifically in the area of soil boring B-8 and the product dispenser. In a June 2010 telephone conversation with Thrifty, LAFD Inspector Luna stated that the hydrocarbon plume was not vertically defined in the area of soil borings B-8 and B-9. In response, it was proposed (in the August 2010 Workplan) that three borings be drilled and sampled at the locations shown on Figure 3. Selected soil samples would be analyzed by a California certified mobile analytical laboratory.

If petroleum fuel contaminant concentrations detected in the soil samples were equal to or greater than those detected during the 2009 investigation, the boring(s) would be converted to SVE well(s). Also, if detected concentrations were consistent with those detected during previous investigations (in both depth and concentration), the threat to groundwater quality would be considered minimal, and interim remedial actions (IRAs) by soil vapor extraction would be sufficient to eliminate any potential impact to groundwater. The proposed borings

were advanced and sampled on November 16th, 17th, and 18th, 2010. Procedures and findings are discussed below.

4.1 Pre-Field Activities

Pre-field activities included the following:

- Preparing a site-specific Health and Safety Plan (HASP),
- Coordinating and scheduling subcontractors for soil boring drilling and laboratory analysis.
- Notifying Underground Service Alert (USA) and performing an underground utility clearance for the planned drilling locations.
- Obtaining any necessary permits.

4.2 Field Procedures

Underground Services Alert was notified of pending drilling activities at the station at least 48 hours prior to commencement of work. A geophysical utility locator was also used for borehole clearance. Prior to drilling, all borehole locations were hand augered to a depth of approximately 5 feet.

All drilling, soil sampling, and well installation activities were performed in accordance with WPI's site-specific HASP and under the direct supervision of a California Professional Geologist. The borings were drilled using a truck-mounted, hollow stem auger rig, operated by Test America Drilling Corporation, a California licensed C-57 contractor. The workplan specified that soil samples would be collected at 5-foot intervals to 90 feet bgs and that samples would be collected at 2.5-foot intervals from 90 feet to the terminal depth in each boring (estimated to be 110 feet). The borings were to be advanced until TPH-G was below detection limits in four consecutive samples (20 feet) and MTBE was below its detection limit in eight consecutive samples (40 feet) or to a maximum depth of 110 feet bgs.

Undisturbed soil samples were obtained from all borings using a modified California split-spoon sampler lined with three 6-inch long by 2-inch diameter brass tubes. The sampler was lowered to the target depth and driven 18 inches into the soil by the repeated drop of a 140-pound hammer from a height of approximately 30 inches.

After the sampler was driven to the desired depth, it was retrieved and the tubes were removed. The tube nearest the sampler toe was commonly selected for laboratory analysis. An aliquot of soil was collected from this tube and preserved using EPA Method 5035. The tube was preserved by sealing each end with Teflon sheets and plastic end caps. Select tubes and all preserved soil aliquots were labeled with a unique number, and recorded on a chain-of-custody form.

A field headspace test was conducted on a portion of soil from each sample interval with a portable photo-ionization detector (PID) calibrated to hexane. The soil was placed in a ZipLoc® bag, and allowed to sit undisturbed for approximately 10 minutes. The PID probe was inserted

into the bag and the organic vapor emission from the soil into the bag headspace was measured. This reading was recorded on a soil boring log maintained for each sampling location and used to select soil samples for analysis by an on-site mobile laboratory.

Soil in the remaining tubes was examined in the field for observable signs of petroleum hydrocarbons and soil classification. Soil was classified in general accordance with the Unified Soil Classification System. Soil classifications and descriptions, including blow counts, grain size, subordinate constituents, color, density, and moisture content were recorded on each boring log.

Samples with headspace measurements greater than 5 ppmv were submitted to the mobile laboratory for analysis. Samples with PID readings less than 5 ppmv were submitted to a stationary California certified laboratory for analysis.

All samples were analyzed for TPH-G using modified EPA Method 8015B and for BTEX, the fuel oxygenate compounds and ethanol using EPA Method 8260B. Method detection limits were set in accordance with the California Water Quality Control Board – Los Angeles Region's (CRWQCB-LAR) UST Program analytical requirements (CRWQCB-LAR, 2005).

Samples SB-2D5, SB-2D15, SB-3D5 through SB-3D45, and SB-3D55 were analyzed by Associated Laboratories, a fixed laboratory. Samples SB-1D5 through SB-1D60, SB2-5D, SB2-D20 through SB2D60, and SB3-D50 and SB3-D60 were analyzed by an on-site mobile laboratory operated by American Analytics.

4.3 Boring / Well Installations

Boring sample results and well installation details for SB-1, SB-2, and SB-3 are discussed in order of installation below. Samples collected from these borings were labeled by boring number and depth. For example the 15-foot sample from boring SB-3 was labeled as SB-3D15.

4.3.1 Boring SB-2

Boring SB-2 was installed on November 16, 2010 at the location shown on Figure 3. High concentrations of volatile organic compounds (VOCs) were measured in the breathing space adjacent to the drill rig at a depth of about 35 feet bgs. VOC concentrations exceeded HASP guidelines for Level D work, and the drill crew was instructed to don full-face air purifying respirators with organic vapor cartridges. VOC concentrations varied widely over the next 5-foot interval. As a precautionary measure, the boring was halted at 45 feet bgs and allowed to vent. Auger were left in the hole, and covered with a metal plate. The plate was sealed with a cold patch asphalt cover, and the crew set up on SB-3.

Once advancement was re-initiated at SB-2, increasing moisture was noted at 50 feet bgs, and appeared to increase in the 55-foot sample. The boring was advanced in 2.5-foot intervals to a depth of 60 feet bgs, with both moisture and clay content continued to increase. At 60 feet bgs, drilling was halted for the day. Augers were left in the hole, just below the ground surface. The hole was covered with a steel plate, and sealed with an asphalt cold patch. The following morning when drilling resumed, approximately two feet of water was measured in the auger.

Since groundwater was not expected to be encountered at this depth, WPI was not prepared to install groundwater monitoring wells during this phase of investigation (groundwater monitoring well permits had not been obtained and there were no provisions for groundwater sampling) and did not want to advance the boring further through a potential confining layer. Therefore the boring was terminated at 62 feet bgs. Results from the SB-2 soil sample laboratory analyses are summarized below.

Chemical	SB-2D5	SB-2D10	SB-2D15	SB-2D20	SB-2D25	SB-2D30	SB-2D35	SB-2D40	SB-2D45	SB-2D50	SB-2D55	SB-2D60
benzene	ND	No Recovery	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
toluene	ND		ND	ND	1	35	ND	14	ND	2.4	0.0027	0.0029
ethyl benzene	ND		ND	4.3	35	25	21	64	1	3.7	0.0093	ND
m,p xylenes	ND		ND	25	100	81	16	220	2.3	12	0.032	ND
o-xylene	ND		ND	19	41	35	60	110	1.1	4.3	0.014	ND
MTBE	ND		ND	ND	ND	ND	28	4.4	0.22	ND	0.28	0.014
TBA	ND		ND	ND	ND	ND	ND	ND	ND	ND	0.22	ND
ETBE	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TAME	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIPE	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethanol	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TPH (GRO)	ND		ND	580	1300	1000	890	3000	180	360	0.81	ND

All concentrations are in mg/kg. Samples collected from 20-60 feet were sampled by the mobile laboratory.

The boring was sealed with bentonite chips from 51 to 62 feet. A dual nested vapor extraction well was set in the boring with screened intervals from 20 to 35 feet bgs (SB-2S) and 40 to 50 feet bgs (SB-2D). A well construction diagram is provided on the SB-2 boring log (Appendix B). Laboratory reports and chain-of-custody documentation are provided as Appendix C.

4.3.2 Boring SB-3

Boring SB-3 was the second boring to be advanced on November 17, 2010. This boring was drilled and sampled as previously described at 5-foot intervals to a depth of 50 feet with no indication of impacted soils from field headspace testing. After 50 feet, the boring was advanced in 2.5-foot intervals to a depth of 60.5 feet bgs. As with SB-2, there were indications of increasing moisture over this depth interval, and soils were at or near saturation at 59 feet bgs. As a precautionary measure, the boring was terminated at 60.5 feet bgs.

The 50 foot sample from SB-3 was analyzed by the mobile laboratory. All other samples were transported under chain-of-custody to Associated Laboratories for analysis. Results are summarized below.

Chemical	SB-3D5	SB-3D10	SB-3D15	SB-3D20	SB-3D25	SB-3D30	SB-3D35	SB-3D40	SB-3D45	SB-3D50	SB-3D55	SB-3D60
benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.0049**	ND	ND
ethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.0039**	ND	ND
o-xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.0017**	ND	ND
MTBE	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.075**	**0.0082**	ND
TBA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.0092j**	ND
ETBE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TAME	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIPE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethanol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TPH (GRO)	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	ND	ND

All concentrations are in mg/kg.
"j" – Flag indicating the value is between the practical quantitation limit and the method detection limit.

Based on the PID field tests and the mobile laboratory results, a vapor extraction well was not set in this boring. The boring was abandoned by tremie grouting to the surface with neat cement. The grout was allowed to settle for approximately four hours then topped off to within 6-inches of the surface. The remaining borehole was filled with concrete and finished at the surface to match existing grade. The boring log is provided in Appendix B. Laboratory reports and chain-of-custody documentation are provided as Appendix C.

4.2.3 Boring SB-1

Boring SB-1 was the final boring to be advanced on November 18, 2010. This boring was also drilled and sampled at 5- foot intervals to a depth of 50 feet with no indication of impacted soils from field headspace testing. All of the soil samples from SB-1 were analyzed by the mobile laboratory. Results are summarized below.

Chemical	SB-1D5	SB-1D10	SB-1D15	SB-1D20	SB-1D25	SB-1D30	SB-1D35	SB-1D40	SB-1D45	SB-1D50	SB-1D55	SB-1D60
benzene	ND	ND	ND	ND	ND	**0.0025**	ND	ND	ND	ND	ND	ND
toluene	**0.0012**	**0.0013**	**0.0015**	ND	**0.0014**	ND	**0.0037**	**0.0016**	**0.0022**	ND	**0.0014**	**0.0017**
ethyl benzene	ND	ND	ND	ND	ND	**0.041**	ND	ND	ND	ND	ND	ND
m,p xylenes	ND	ND	ND	ND	ND	**0.052**	**0.0067**	**0.0067**	**0.0022**	ND	ND	ND
o-xylene	ND	ND	ND	ND	ND	**0.0077**	ND	ND	ND	ND	ND	ND
MTBE	ND	ND	ND	**0.098**	**0.033**	**0.92**	**0.36**	**0.68**	**0.124**	ND	**0.0052**	**0.002**
TBA	ND	ND	ND	**0.11**	**0.11**	**0.13**	**0.14**	**0.3**	**0.3**	ND	**2.2**	**0.93**
ETBE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TAME	ND	ND	ND	ND	ND	**0.0048**	ND	**0.0049**	ND	ND	ND	ND
DIPE	ND	ND	ND	ND	ND	**0.0057**	ND	**0.0028**	ND	ND	ND	ND

Chemical	SB-1D5	SB-1D10	SB-1D15	SB-1D20	SB-1D25	SB-1D30	SB-1D35	SB-1D40	SB-1D45	SB-1D50	SB-1D55	SB-1D60
Ethanol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TPH (GRO)	ND	ND	ND	ND	ND	**0.73**	**0.35**	**0.46**	**0.16**	ND	ND	ND

After 50 feet, the boring was advanced in 2.5-foot intervals to a depth of 60.5 feet bgs. As with SB-1 and SB-2 both moisture and clay content increased over this depth interval, however, the amount of moisture was much less than observed at SB-2. As a precautionary measure, the boring was terminated at 60.5 feet bgs.

A vapor extraction well was set in boring SB-1, with a screened interval of 30 to 50 feet bgs. The interval from 51 to 60.5 feet bgs was sealed with bentonite chips. A well construction diagram is provided on the SB-1 boring log (Appendix B). Laboratory reports and chain-of-custody documentation are provided as Appendix C.

4.4 Disposal of Investigation Derived Wastes

Soil generated from the borings and sample decontamination water was placed in DOT approved 55-gallon drums. These drums were sealed and labeled as they were filled and upon completion of each work day. Analytical results from the soil analyses will be used to select an appropriate off-site disposal facility for these wastes. Manifest documenting transportation and the off-site disposal of these wastes will be provided under separate cover if requested.

5.0 CONCLUSIONS

The following conclusions are based on the results of this investigation:

- Elevated concentrations of petroleum fuel contaminants were detected on the west side of the western most dispenser islands and the western end of the UST pit. The highest concentrations were detected adjacent to the western most dispenser island.

- The most highly impacted depth interval is approximately 25 to 40 feet bgs. Isoconcentration maps for TPH-G/GRO, benzene, MTBE, and TBA are provided as Figures 7, 8, 9, and 10, respectively.

- Benzene was only detected in one soil sample (SB-1D30 at a concentration of 0.0025 mg/kg). This may indicate an older release, and/or active natural degradation of contaminants.

- Soils at or near saturation were encountered at depths of about 55 to 59 feet during drilling of SB-2 and SB-3. The existence of water at these locations and depths appears to be due to perched conditions, as the sandy layer where groundwater was encountered is underlain by finer grained sediments at both locations. Although indications of

moisture were observed at SB-1, there was no indication of saturated soils, suggesting that the observed water bearing sediments are localized and of limited extent.

- Sediments observed at terminal depth generally consisted of silty sands with trace amounts of clay, comprising a potential confining layer. The existence of these finer grained sediments may prohibit or retard the downward migration of contaminants.

6.0 RECOMMENDATIONS

A mobile vacuum extraction event is recommended to evaluate the effectiveness of vapor extraction at the site. Objectives of the test would include evaluating vapor flow rates, mass removal rates and contaminant rebound. Extraction should be performed with a mobile SVE rig capable of extracting vapors at 250 standard cubic feet per minute (scfm) and achieving a vacuum of at least 12 inches of mercury (inches Hg). Extraction wells should be sealed at the surface to prevent intrusion of atmospheric air.

The test should utilize SB-1, SB-2S and SB-2D, and be conducted for 36 hours (twelve hours at each well), or until vapor phase contaminant concentrations become asymptotic at low levels. Well head vacuums, extracted vapor flow rates and contaminant vapor concentration (as measured with a PID calibrated to hexane) should be measured periodically as described below.

As extraction is conducted on each well, influent contaminant vapor concentrations should be measured with the PID at the beginning of extraction and every hour thereafter. Other parameters such as manifold applied vacuum (inches of Hg), vapor system flow rate (scfm), system flow temperature (degrees Fahrenheit) and extraction wellhead vacuum should be recorded every hour.

Influent contaminant vapor samples for laboratory analysis should be collected one hour, 6 hours and at the end of extraction for each well. These samples should be analyzed for total petroleum hydrocarbons as gasoline using modified EPA method 8015B, and for benzene, toluene, ethyl benzene, total xylenes and the fuel oxygenates using EPA method 8260B.

After the test is completed, a report will be prepared that documents test procedures and provides an evaluation of SVE effectiveness, including mass removal rates, and total mass removed from each well.

7.0 REFERENCES

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TABLES