December 31, 2009

Mr. Mark E. Detterman
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: Soil Vapor Assessment
Rodding Cleaning Services
2585 Nicholson Street, San Leandro, CA
Fuel Leak Case No. RO00000020
Versar Project No. 104422.4422.007

Dear Mr. Detterman:

Versar, Inc. (Versar) has performed a soil vapor assessment, as directed in an Alameda County Health Care Services letter dated 7 October 2008, at the former Rodding Cleaning Service facility at 2585 Nicholson Street, in San Leandro, California (Site). The Site location is depicted in **Figure 1**. The work was performed in accordance with the California Environmental Protection Agency (EPA), Department of Toxic Substances Control (DTSC), Human and Ecological Risk Division (HERD), *Interim Final – Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (February 2007 rev.).

INTRODUCTION

The purpose of the soil vapor survey is to characterize concentrations of volatile organic compounds (VOCs), specifically BTEX, in the vapor phase in shallow soil, adjacent to the nearby building at 2591 Nicholson Street, and surrounding the former UST excavation area and MW-1. The results of the survey will be used to: 1) assess if there is a significant potential impact to indoor air quality (IAQ) in a building adjacent to the release area, and 2) investigate the potential source of the benzene concentrations in the subsurface.

The soil vapor assessment comprised collection of soil vapor samples from beneath concrete pavement at ten Site vapor sample locations, analysis of the samples following the DTSC – HERD guidelines and 1) presenting a Tier I assessment of the risk to indoor air quality based on the findings; and 2) characterizing the distribution of benzene in the subsurface with respect to a potential source.

SITE BACKGROUND

The Site is located at 2585 Nicholson Street in San Leandro, California. The nearest cross street is Republic Avenue. **Figure 1** shows the general Site location. The Site is currently occupied by Crane

Works and consists of a single-story commercial office building at the north end of the property, and covered parking/work areas over the western and southern edges of the property.

Two underground storage tanks (USTs) were removed from the Site in 1991. Soil and groundwater samples collected during the UST removal activities identified total petroleum hydrocarbons (TPH) as diesel and gasoline (-d and –g) in both media. Reportedly, over-excavation was performed during UST removal activities.

In 1992, on-Site soil, groundwater and soil gas investigations were performed comprising 19 borings and one monitoring well (MW-1) installed in the central portion of the Site. Groundwater samples were collected from MW-1 between 1992 and 1995. Free-floating product was observed to a maximum thickness of 1.25 inches during some of the sampling events. Oil absorbent socks were subsequently used to remove the free-floating product.

In 1997 and 1998, limited investigations of soil and groundwater were performed on and off-Site. Adequate definition of petroleum hydrocarbons in soil and groundwater was considered to be completed and the contaminant plume found to be relatively stable with minimal off-Site migration.

In April 1999, Versar installed four additional monitoring wells (MW-2 through MW-5) surrounding the Site to confirm and document plume stability. Versar detected TPH-g in the southern half of the Site; groundwater was confirmed to be flowing in a southeasterly direction. Quarterly groundwater monitoring of all Site wells was performed between July 1999 and April 2001. Methyl-tert-butyl ether (MTBE) was not detected during the monitoring events, and the ACHCS granted no further analysis of the compound in their October 29, 1999 letter. Data from the monitoring showed limited fluctuation of petroleum constituents in source-area monitoring well MW-1, and only trace concentrations of the Site constituents of concern in cross- and down-gradient off-Site monitoring wells, MW-4 and MW-5.

In November 1999, Versar performed a Risk-Based Corrective Action (RBCA) analysis of residual petroleum hydrocarbons in groundwater at the Site. The RBCA analysis was re-performed for soil in Versar's letter *Additional Research and Evaluation*, dated May 15, 2001. The purpose of the RBCA analyses was to determine the magnitude of risk, if any, to human health associated with Site soil and groundwater contamination. The analyses were prepared using conservative default parameters and existing Site data. Versar's RBCA analyses found that residual concentrations of aromatic hydrocarbons in first-encountered groundwater at the location of maximum impact (MW-1) do not present an actionable risk to human health under a commercial/industrial setting.

At the request of the ACHCS, Versar performed additional research and evaluation, which was presented in the Versar letter dated May 15, 2001. The additional research and evaluation consisted of the following primary findings: 1) well survey and door to door survey of the surrounding area did not identify any groundwater wells proximal to the Site; 2) no preferential pathways, such as underground utilities, were associated with the Site; and 3) additional evidence and evaluation of plume characterization and stability was provided.

In a letter from the ACHCS dated June 4, 2001, a reduction to the groundwater monitoring program was granted; comprising semi-annual monitoring of one well (MW-1). Analytical results for TPH-g and benzene in MW-1 have remained above prospective mitigation action levels. TPH-g concentrations over time appear to trend downward; benzene concentrations do not appear to be decreasing. The calculated direction of groundwater flow, based on information collected from all the Site wells, appears to be southerly at a gradient equal to or less than 0.002 feet per foot.

SOIL VAPOR INVESTIGATION

Versar's soil vapor investigation was performed following the methods and procedures described in the Work Plan to Conduct Soil Vapor Assessment dated July 21, 2009. The vapor assessment comprised collecting shallow soil vapor samples from ten sample point locations surrounding groundwater monitoring well, MW-1, and adjoining the southern property boundary. The survey area is located in a concrete slab-surfaced exterior courtyard used for the storage of equipment, and as a driveway. **Figure 2** shows the sample locations.

Each of the soil vapor samples collected was analyzed by a California-certified mobile laboratory (Transglobal Environmental Geochemistry, TEG) for benzene, toluene, ethylbenzene and total xylenes (BTEX), methyl tert-butyl ether (MTBE) and total petroleum hydrocarbons (TPH)-gasoline by EPA Method 8260B. Copies of the laboratory analytical results are included in **Attachment 4**. The results from the samples are presented in **Table 1**.

Field Work

Versar conducted the soil vapor survey on October 21, 2009. TEG provided the direct push technology services as well as the mobile laboratory analytical services. Soil vapor samples were collected at depths between 4.0 and 5.0 feet below ground surface (bgs). All borings were advanced by hand-held equipment (roto hammer). At vapor sample points V-1, V-3, V-4, V-9 and V-10 samples were collected at 5.0 feet bg. At vapor sample points V-2, V-6 and V-7 samples were collected from 4.5 bgs, and at locations V-5 and V-8, samples were collected from 4.0 feet bgs. Sample depth variability reflected subsurface conditions where fine-grained soil prevented soil vapor withdrawal.

Soil gas samples were collected in general accordance with Interim Guidance for Active Soil Gas Investigation (RWQCB 2007). At each sampling location, a soil vapor sampling push-rod probe was advanced to the planned sampling interval at a minimum of four to five feet bgs. The concrete pavement penetration surface surrounding the probe rod was sealed with hydrated bentonite powder. At each selected subsurface sample interval, the rod was retracted leaving the probe tip in place and exposing the probe tubing inlet. The subsurface sample area was then allowed to approach soil vapor equilibrium during a period of 20 to 30 minutes, prior to purging the probe, rod and coupling void spaces.

A purge test to identify the optimal sample purge volume, comprising three different sample withdrawal volumes (the summed volume of the sample tubing, sample container and probe), was

performed on boring V-1. Based on the results of the on-Site analysis of the purge volume samples, TEG determined the optimal purge volume to be one. Subsequently, TEG purged one sample system volume prior to collecting each sample.

Couplings in exposed couplings and joints were leak-tested per DTSC guidelines. Prior to each sample collection, a tracer gas (1,1 Difluoroethane) was made proximal to the floor seal and at exposed vapor collection system joints to document collection sampling system integrity. The soil gas sample was then collected by syringe at a rate between 100 to 200 milliliters per minute (ml/min).

After each use, drive rods and other reusable components were decontaminated with a 3-stage wash and rinse (water plus non-phosphate detergent, tap water rinse, and distilled water rinse). Clean, disposable gloves were worn by all field personnel when handling the decontaminated equipment.

The samples were appropriately labeled for identification purposes and analyzed on Site in a state-certified mobile laboratory. Chain-of-custody (COC) procedures, including the use of COC forms, were used to document sample collection, handling, and transport to the laboratory described herein. Soil gas samples were analyzed for BTEX, MTBE and TPH-g by EPA Method 8260b. Prospective soil vapor thresholds, reporting limits (RLs) and IAQ goals are included in **Table 1** of this report.

New sample syringes were used to collect samples from each sample point. Each sample syringe was sealed and labeled with Site and sample-specific alpha-numeric identification, and transported under Chain-of-Custody protocol to TEG's on-Site mobile analytical laboratory.

Sample Analysis

Each of the five soil vapor samples collected from the Site by TEG were immediately transported to their on-Site mobile laboratory (CA-ELAP ID#1671) and analyzed for BTEX, MTBE, Napthalene and TPH-g by EPA Method 8260b, and TPH-d by EPA Method 8015m. **Table 1 (Attachment 2)** summarizes the laboratory analytical results. Copies of the laboratory analytical results are included as **Attachment 4**.

FINDINGS

Soil vapor concentrations were compared to prospective human health protection action levels: 2008 SFRWQCB Tier 1 ESLs for soil vapor (Table E-2), and 2005 California EPA CHHSLs for shallow soil gas (CHSSL Table 2). CHHSLs are not available for TPH-g. U.S. EPA screening levels are not promulgated for soil vapor with respect to indoor air quality. The ESL and CHHSL action levels for each contaminant analyzed at the Site are included in **Table 1, Attachment 2**, and are included individually in **Attachment 3**. With the exception of sample V-8, all other samples had at least one analyte that exceeded an action level. The soil vapor findings per sample location are summarized as follows:

- At location V-1, benzene (37,000 $\mu g/m^3$), ethylbenzene (13,000 $\mu g/m^3$) and TPH-gasoline (1,600,000 $\mu g/m^3$) exceeded their applicable Tier 1 ESLs.

- At location V-2, benzene (35,000 $\mu g/m^3$), ethylbenzene (5,700 $\mu g/m^3$) and TPH-gasoline (2,300,000 $\mu g/m^3$) exceeded their applicable Tier 1 ESLs.

- At location V-3, benzene (530,000 $\mu g/m^3$), ethylbenzene (6,800 $\mu g/m^3$) and TPH-gasoline (38,000,000 $\mu g/m^3$) exceeded their applicable Tier 1 ESLs.

- At location V-4, benzene (610,000 $\mu g/m^3$), toluene (420,000 $\mu g/m^3$), ethylbenzene (73,000 $\mu g/m^3$), m,p-Xylene (180,000 $\mu g/m^3$) and TPH-gasoline (23,000,000 $\mu g/m^3$) exceeded their applicable Tier 1 ESLs.

- At location V-5, benzene (380,000 $\mu g/m^3$), toluene (320,000 $\mu g/m^3$), ethylbenzene (130,000 $\mu g/m^3$), m,p-Xylene (370,000 $\mu g/m^3$), o-Xylene (110,000 $\mu g/m^3$), and TPH-gasoline (11,000,000 $\mu g/m^3$) exceeded their applicable Tier 1 ESLs.

- At location V-6, benzene (890,000 $\mu g/m^3$), ethylbenzene (120,000 $\mu g/m^3$), m,p-Xylene (270,000 $\mu g/m^3$), and TPH-gasoline (31,000,000 $\mu g/m^3$) exceeded their applicable Tier 1 ESLs.

- At location V-7, benzene (210,000 $\mu g/m^3$), toluene (180,000 $\mu g/m^3$), ethylbenzene (42,000 $\mu g/m^3$), m,p-Xylene (120,000 $\mu g/m^3$), and TPH-gasoline (4,000,000 $\mu g/m^3$) exceeded their applicable Tier 1 ESLs.

- At location V-9, benzene (5,300 $\mu g/m^3$), ethylbenzene (5,700 $\mu g/m^3$) and TPH-gasoline (300,000 $\mu g/m^3$) exceeded their applicable Tier 1 ESLs.

- At location V-10, benzene (190,000 $\mu g/m^3$), toluene (560,000 $\mu g/m^3$), ethylbenzene (63,000 $\mu g/m^3$), m,p-Xylene (180,000 $\mu g/m^3$), and TPH-gasoline (9,000,000 $\mu g/m^3$) exceeded their applicable Tier 1 ESLs.

The tracer gas, 1,1-Difluoroethane, was not detected in any of the samples; therefore, vapor sample system leakage (sample dilution) is not apparent.

DISCUSSION

The DTSC CHSSL thresholds for benzene and toluene in a commercial/industrial setting are exceeded in soil vapor at the Site. The analogous SFRWQCB ESL thresholds for benzene, toluene, ethylbenzene, xylenes and TPH-gasoline were also exceeded at the Site. One or both thresholds were exceeded in every vapor sampling point except V-8, the southeastern-most sampling location. The vapor sampling point locations having the highest concentrations are located at the most northwestern locations, V-3 and V-4; the three central locations, V-5, 6 and 7; and the southeastern-most point, V-10. Review of sediment stratigraphy in Site boring logs suggests a correlation between the highest soil vapor concentrations and the extent of more granular sediments below a depth of approximately

6 feet bgs, as well as with the location of the former product dispenser; a potential source along with the former UST excavation, which was located in the area of the central vapor sample points.

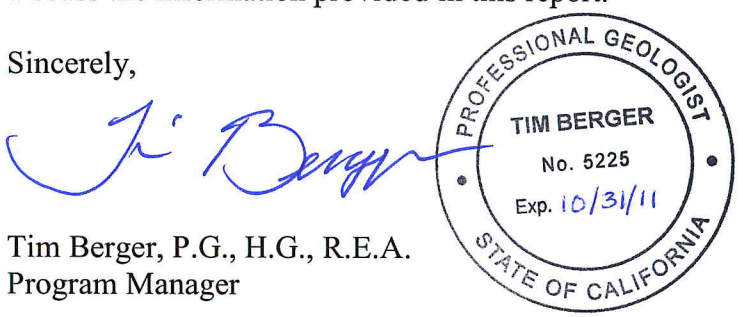
The Tier 1 risk evaluation thresholds promulgated by Cal EPA by the DTSC and SFRWQCB are exceeded within the un-enclosed working courtyard of the Site. Elevated soil vapor concentrations are located adjacent to enclosed building office space within the Site, as well as the adjoining commercial office building at 2591 Nicholson Street.

CONCLUSIONS

A potential for impact to indoor air quality is indicated by the findings of the soil vapor survey, with receptors being the on-Site offices in the northwestern corner of the Site and the adjoining building at 2591 Nicholson Street. The source of the soil vapor concentrations appears to be the areas of the former USTs and dispenser, with residual contaminants distribution controlled by localized permeable sediments in the shallow subsurface, at or just below the groundwater table. A cause for the apparent enrichment of benzene in residual contaminants remains unknown.

Please contact me at (916) 863-9323 and tberger@versar.com if there are questions, or to further discuss the information provided in this report.

Sincerely,



Tim Berger, P.G., H.G., R.E.A.
Program Manager

Attachments

Figure
Table
Soil Gas Screening Criteria Levels
Laboratory Analytical Results

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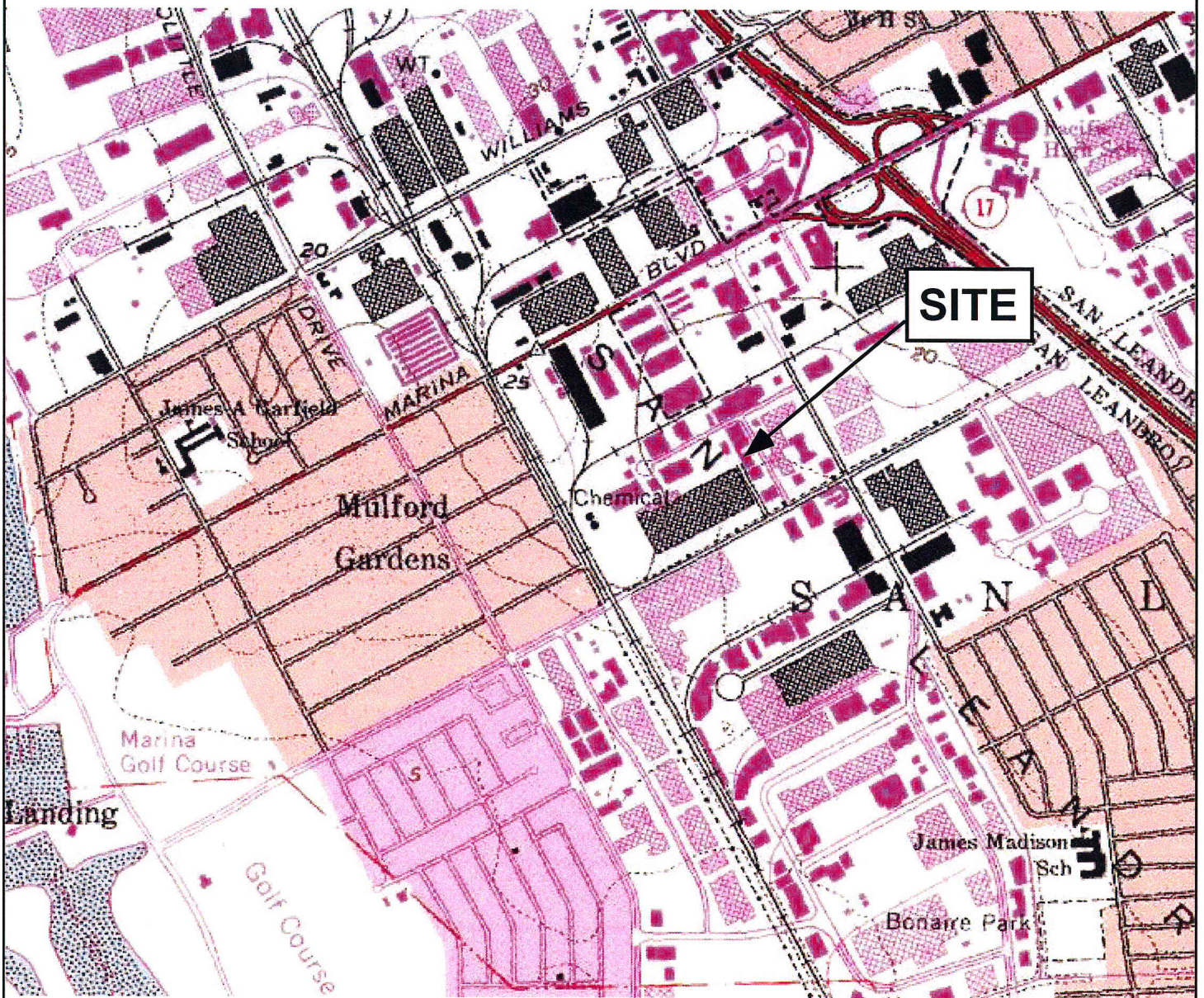
ATTACHMENT 1

FIGURES



Ref. USGS 7.5 Minute Topographical Quadrangle Maps; San Leandro, Calif. c. 1959 Photorevised 1998

Dr. By: TWB	
Date: 6/20/08	
Scale: 1 inch=2,000 feet	
Versar Project No. 4422-007	
Path/File : P\BOFA\SANLEAN\REPORT\Fig1	

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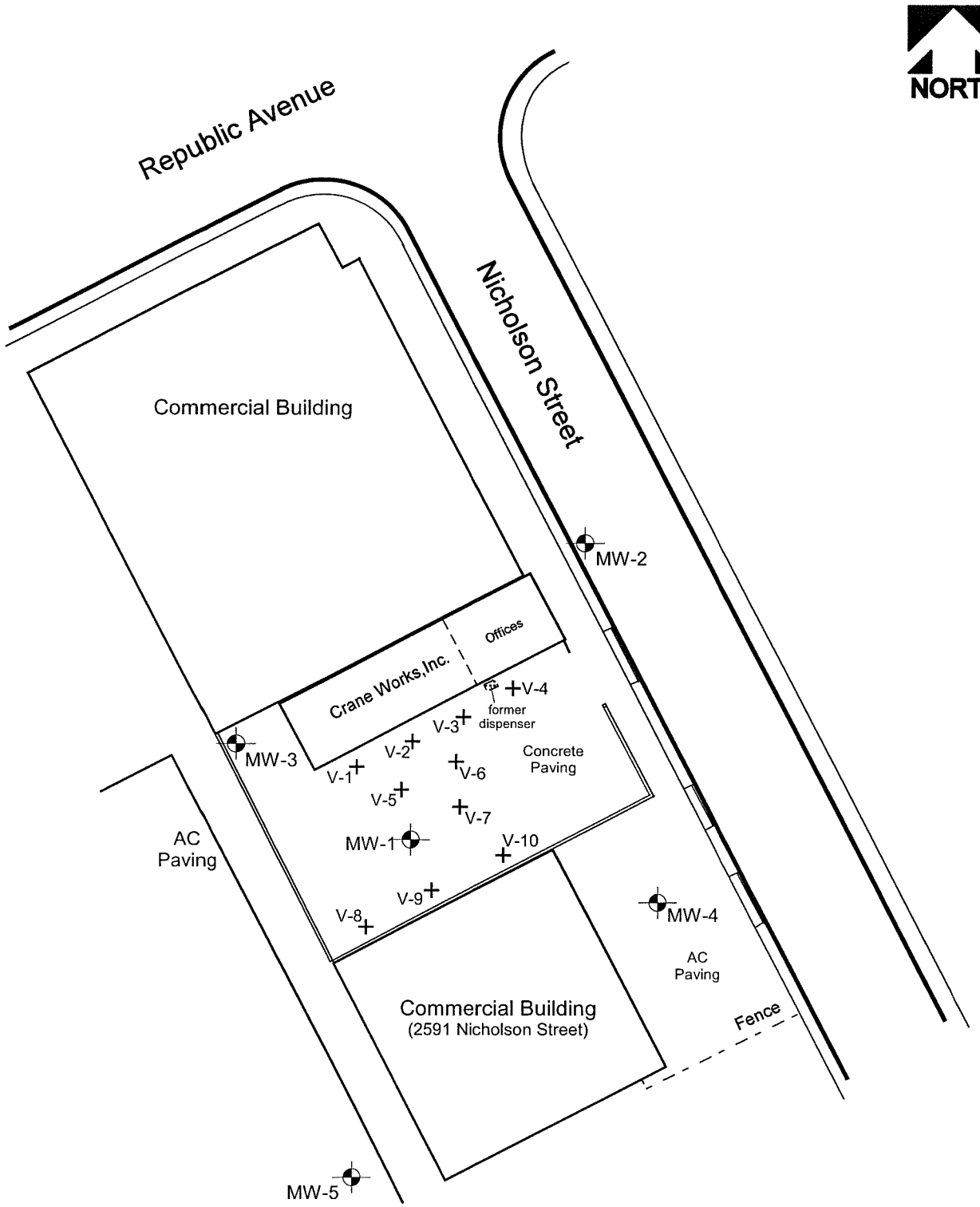
SITE LOCATION MAP

Former Rodding Cleaning Services
2585 Nicholson Street
San Leandro, California

Figure 1



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Date: 06/23/2009	
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SOIL VAPOR SURVEY SAMPLE LOCATIONS

Former Rodding Cleaning Services
2585 Nicholson Street
San Leandro, California

Figure 2

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ATTACHMENT 2

TABLE

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TABLE 1
SOIL GAS RESULTS
SUMMARY

Former Rodding Cleaning Services
2585 Nicholson Street
San Leandro, California

CHEMICAL	Sample Location (October 21, 2009)												Action Levels	
	V-1	V-2	V-2 (duplicate)	V-3	V-4	V-5	V-6	V-7	V-8	V-9	V-10	Probe Blank	SFRWQCB	Cal EPA
	5.0 ft bgs	4.5	4.5	5.0 ft bgs	5.0 ft bgs	4.0	4.5	4.5	4.0	5	5	NA	ESL*	CHHSL**
	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)
Benzene	**37,000**	**35,000**	**49,000**	**530,000**	**610,000**	**380,000**	**890,000**	**210,000**	<100	**5,300**	**190,000**	<100	280	122
Toluene	40,000	390	370	4,200	**420,000**	**320,000**	42,000	**180,000**	<200	21,000	**560,000**	<200	180,000	378,000
Ethylbenzene	**13,000**	**5,700**	**4,900**	**6,800**	**73,000**	**130,000**	**120,000**	**42,000**	<100	**5,700**	**63,000**	<100	3,300	Postponed***
m,p-Xylene	37,000	2,400	2,000	2,700	**180,000**	**370,000**	**270,000**	**120,000**	<200	22,000	**180,000**	<200	58,000	887,000
o-Xylene	11,000	<100	<100	<100	57,000	**110,000**	45,000	35,000	<100	7,600	54,000	<100	58,000	879,000
MTBE	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	31,000	13,400
TPH-gasoline	**1,600,000**	**2,300,000**	**3,400,000**	**38,000,000**	**23,000,000**	**11,000,000**	**31,000,000**	**4,000,000**	<10,000	**300,000**	**9,000,000**	<10,000	29,000	--
1,1 Difluoroethane (tracer gas)	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	--	--

Notes:

ft bgs: feet below ground surface, depth of sample collection

ug/m3: Micrograms per cubic meter

* : Table E2 Shallow Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion Concerns

** : Table 2 California Human Health Screening Levels (CHHSL) for Indoor Air and Shallow Soil Gas, Shallow Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion Concerns

Bold: Sample result is above the action level

<100: Less than the stated laboratory reporting limit (RL)

***: Calculation of a screening number for the chemical has been postponed until the toxicity criterion currently being developed by OEHHA is published as a final document.

--: No data

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ATTACHMENT 3

SOIL GAS SCREENING CRITERIA

Table E-2. Shallow Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion Concerns (volatile chemicals only)

Chemcial	Physical State		Residential Exposure			Commercial/Industrial Land Use		
			Lowest Residential	Carcinogenic Effects	Noncarcinogenic Effects	Lowest C/I	Carcinogenic Effects	Noncarcinogenic Effects
			($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
Acenaphthene	V	S	4.4E+04		4.4E+04	1.2E+05		1.2E+05
Acenaphthylene	V	S	2.2E+04		2.2E+04	6.1E+04		6.1E+04
Acetone	V	L	6.6E+05		6.6E+05	1.8E+06		1.8E+06
Aldrin	NV	S						
Anthracene	V	S	2.2E+05		2.2E+05	6.1E+05		6.1E+05
Antimony	NV	S						
Arsenic	NV	S						
Barium	NV	S						
Benzene	V	L	8.4E+01	8.4E+01	6.3E+03	2.8E+02	2.8E+02	1.8E+04
Benzo(a)anthracene	NV	S						
Benzo(b)fluoranthene	NV	S						
Benzo(k)fluoranthene	NV	S						
Benzo(g,h,i)perylene	NV	S						
Benzo(a)pyrene	NV	S						
Beryllium	NV	S						
1,1-Biphenyl	V	S						
Bis(2-chloroethyl) ether	V	L	7.4E+00	7.4E+00		2.5E+01	2.5E+01	
Bis(2-chloroisopropyl) ether	V	L	3.4E+00	3.4E+00	2.9E+04	1.2E+01	1.2E+01	8.2E+04
Bis(2-ethylhexyl) phthalate	NV	S						
Boron	NV	S						
Bromodichloromethane	V	L	1.4E+02	1.4E+02	1.5E+04	4.6E+02	4.6E+02	4.1E+04
Bromoform (Tribromomethane)	NV	S						
Bromomethane	V	G	1.0E+03		1.0E+03	2.9E+03		2.9E+03
Cadmium	NV	S						
Carbon tetrachloride	V	L	1.9E+01	1.9E+01	8.3E+03	6.3E+01	6.3E+01	2.3E+04
Chlordane	NV	S						
p-Chloroaniline	NV	S						
Chlorobenzene	V	L	2.1E+05		2.1E+05	5.8E+05		5.8E+05
Chloroethane	V	G	2.1E+04		2.1E+04	5.8E+04		5.8E+04
Chloroform	V	L	4.6E+02	4.6E+02	6.3E+04	1.5E+03	1.5E+03	1.8E+05
Chloromethane	V	G	1.9E+04		1.9E+04	5.3E+04		5.3E+04
2-Chlorophenol	V	L	3.7E+03		3.7E+03	1.0E+04		1.0E+04
Chromium (total)	NV	S						
Chromium III	NV	S						
Chromium VI	NV	S						

Table E-2. Shallow Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion Concerns (volatile chemicals only)

Chemcial	Physical State		Residential Exposure			Commercial/Industrial Land Use		
			Lowest Residential	Carcinogenic Effects	Noncarcinogenic Effects	Lowest C/I	Carcinogenic Effects	Noncarcinogenic Effects
			($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
Chrysene	NV	S						
Cobalt	NV	S						
Copper	NV	S						
Cyanide	NV	S	1.5E+04		1.5E+04	4.1E+04		4.1E+04
Dibenz(a,h)anthracene	NV	S						
Dibromochloromethane	V	S						
1,2-dibromo-3-chloropropane	V	L	1.3E+00	1.3E+00	4.2E+01	4.3E+00	4.3E+00	1.2E+02
1,2-Dibromoethane	V	S	4.1E+00	4.1E+00	1.9E+03	1.4E+01	1.4E+01	5.3E+03
1,2-Dichlorobenzene	V	L	4.2E+04		4.2E+04	1.2E+05		1.2E+05
1,3-Dichlorobenzene	V	L	2.2E+04		2.2E+04	6.1E+04		6.1E+04
1,4-Dichlorobenzene	V	S	2.2E+02	2.2E+02	1.7E+05	7.4E+02	7.4E+02	4.7E+05
3,3-Dichlorobenzidine	NV	S						
Dichlorodiphenyldichloroethane (DDD)	NV	S						
Dichlorodiphenyldichloroethene (DDE)	NV	S						
Dichlorodiphenyltrichloroethane (DDT)	NV	S						
1,1-Dichloroethane	V	L	1.5E+03	1.5E+03	1.0E+05	5.1E+03	5.1E+03	2.9E+05
1,2-Dichloroethane	V	L	9.4E+01	9.4E+01	1.0E+03	3.1E+02	3.1E+02	2.9E+03
1,1-Dichloroethene	V	L	4.2E+04		4.2E+04	1.2E+05		1.2E+05
cis-1,2-Dichloroethene	V	L	7.3E+03		7.3E+03	2.0E+04		2.0E+04
trans-1,2-Dichloroethene	V	L	1.5E+04		1.5E+04	4.1E+04		4.1E+04
2,4-Dichlorophenol	NV	S						
1,2-Dichloropropane	V	L	2.4E+02	2.4E+02	8.3E+02	8.2E+02	8.2E+02	2.3E+03
1,3-Dichloropropene	V	L	1.5E+02	1.5E+02	4.2E+03	5.1E+02	5.1E+02	1.2E+04
Dieldrin	NV	S						
Diethyl phthalate	NV	S						
Dimethyl phthalate	NV	S						
2,4-Dimethylphenol	V	S						
2,4-Dinitrophenol	NV	S						
2,4-Dinitrotoluene	NV	S						
1,4-Dioxane	NV	L						
Dioxin (2,3,7,8-TCDD)	NV	S						
Endosulfan	NV	S						
Endrin	NV	S						
Ethylbenzene	V	L	9.8E+02	9.8E+02	2.1E+05	3.3E+03	3.3E+03	5.8E+05
Fluoranthene	NV	S						

Table E-2. Shallow Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion Concerns (volatile chemicals only)

Chemcial	Physical State		Residential Exposure			Commercial/Industrial Land Use		
			Lowest Residential	Carcinogenic Effects	Noncarcinogenic Effects	Lowest C/I	Carcinogenic Effects	Noncarcinogenic Effects
			($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
Toxaphene	NV	S						
TPH (gasolines)	V	L	1.0E+04		1.0E+04	2.9E+04		2.9E+04
TPH (middle distillates)	V	L	1.0E+04		1.0E+04	2.9E+04		2.9E+04
TPH (residual fuels)	NV	L/S						
1,2,4-Trichlorobenzene	V	L	8.3E+02		8.3E+02	2.3E+03		2.3E+03
1,1,1-Trichloroethane	V	L	4.6E+05		4.6E+05	1.3E+06		1.3E+06
1,1,2-Trichloroethane	V	L	1.5E+02	1.5E+02	2.9E+03	5.1E+02	5.1E+02	8.2E+03
Trichloroethene	V	L	1.2E+03	1.2E+03	1.3E+05	4.1E+03	4.1E+03	3.5E+05
2,4,5-Trichlorophenol	V	S	7.3E+04		7.3E+04	2.0E+05		2.0E+05
2,4,6-Trichlorophenol	NV	S						
Vanadium	NV	S						
Vinyl chloride	V	G	3.1E+01	3.1E+01	2.1E+04	1.0E+02	1.0E+02	5.8E+04
Xylenes	V	L	2.1E+04		2.1E+04	5.8E+04		5.8E+04
Zinc	NV	S						

Notes:

Soil gas screening levels intended to be protective of indoor air quality, calculated for volatile chemicals only.
Physical state of chemical at ambient conditions (V - volatile, NV - nonvolatile, S - solid, L - liquid, G - gas).
Chemical considered to be volatile if Henry's Law constant (atm m^3/mole) $>10^{-5}$ and molecular weight <200 (see Table E-1).
Dibromochloromethane, dibromochloropropane and pyrene considered volatile for purposes of modeling (USEPA 2004).
Target cancer risk = 1E-06, Target Hazard Quotient = 0.2 for all chemicals.
Residential soil gas:indoor air attenuation factor = 0.001 (1/1000). Commercial/industrial soil gas:indoor air attenuation factor = 0.0005 (1/2000).
Soil gas screening level for ethanol based on potential indoor air nuisance concerns (refer to Section 5.3.3 and Table H series).
soils or limited soil impacts and no groundwater source of VOCs.

Table 2. California Human Health Screening Levels for Indoor Air and Soil Gas

Chemical	[1]Indoor Air Human Health Screening Levels ($\mu g/m^3$)		[2]Shallow Soil Gas Human Health Screening Levels (Vapor Intrusion) ($\mu g/m^3$)	
	Residential Land Use	Commercial/ Industrial Land Use Only	Residential Land Use	Commercial/ Industrial Land Use Only
Benzene	8.40 E-02	1.41 E-01	3.62 E+01	1.22 E+02
Carbon Tetrachloride	5.79 E-02	9.73 E-02	2.51 E+01	8.46 E+01
1,2-Dichloroethane	1.16 E-01	1.95 E-01	4.96 E+01	1.67 E+02
cis-1,2-Dichloroethylene	3.65 E+01	5.11 E+01	1.59 E+04	4.44 E+04
trans-1,2-Dichloroethylene	7.30 E+01	1.02 E+02	3.19 E+04	8.87 E+04
Ethylbenzene	Postponed[3]	Postponed[3]	Postponed[3]	Postponed[3]
Mercury, elemental	9.40 E-02	1.31 E-01	4.45 E+01	1.25 E+02
Methyl tert-Butyl Ether	9.35 E+00	1.57 E+01	4.00 E+03	1.34 E+04
Naphthalene	7.20 E-02	1.20 E-01	3.19 E+01	1.06 E+02
Tetrachloroethylene	4.12 E-01	6.93 E-01	1.80 E+02	6.03 E+02
Tetraethyl Lead	3.65 E-04	5.11 E-04	2.06 E-01	5.78 E-01
Toluene	3.13 E+02	4.38 E+02	1.35 E+05	3.78 E+05
1,1,1-Trichloroethane	2.29 E+03	3.21 E+03	9.91 E+05	2.79 E+06
Trichloroethylene	1.22 E+00	2.04 E+00	5.28 E+02	1.77 E+03
Vinyl Chloride	3.11 E-02	5.24 E-02	1.33 E+01	4.48 E+01
m-Xylene	7.30 E+02	1.02 E+03	3.19 E+05	8.87 E+05
o-Xylene	7.30 E+02	1.02 E+03	3.15 E+05[4]	8.79 E+05[4]
p-Xylene	7.30 E+02	1.02 E+03	3.17 E+05	8.87 E+05

Reference: Appendix 1, OEHHA Target Indoor Air Concentrations and Soil-Gas Screening Numbers for Existing Buildings under Residential and Industrial/Commercial land uses.

Notes:

1. "Residential Land Use" screening levels generally considered adequate for other sensitive uses (e.g., day-care centers, hospitals, etc.). Commercial/industrial properties should be evaluated using both residential and commercial/industrial CHHSLs. A deed restriction that prohibits use of the property for sensitive purposes may be required at sites that are evaluated and/or remediated under a commercial/industrial land use scenario only.
Calculation of cumulative risk may be required at sites where multiple contaminants with similar health effects are present.
Carcinogens: CHHSLS based on target cancer risk of 10-6. Cal/EPA cancer slope factors used when available.
Noncarcinogens: CHHSLS based on target hazard quotient of 1.0.
2. Soil Gas: Screening levels based on soil gas data collected <1.5 meters (five feet) below a building foundation or the ground surface. Intended for evaluation of potential vapor intrusion into buildings and subsequent impacts to indoor-air. Soil gas data should be collected and evaluated at all sites with significant areas of VOC-impacted soil. Screening levels also apply to sites that overlie plumes of VOC-impacted groundwater.
3. Calculation of a screening number for the chemical has been postponed (pp) until the toxicity criterion currently being developed by OEHHA is published as a final document.
4. Representative Screening Numbers for mixed xylenes. The representative value for mixed xylenes is based on the calculated lowest one amongst the three isomers.

VERSAR

ATTACHMENT 4

LABORATORY ANALYTICAL RESULTS

TEG Northern California Inc.

24 November 2009

Mr. David Sendek
Versar, Inc.
7844 Madison Ave., Suite 167
Fair Oaks, CA 95628

SUBJECT: DATA REPORT - Versar Project # 104422.4422.007
2585 Nicholson Street, San Leandro, California

TEG Project # 91021D

Mr. Sendek:

Please find enclosed a data report for the samples analyzed from the above referenced project for Versar. The samples were analyzed on site in TEG's mobile laboratory. TEG conducted a total of 13 analyses on 13 soil vapor samples.

-- 13 analyses on soil vapors for aromatic volatile hydrocarbons (BTEX), fuel oxygenate MtBE, and total petroleum hydrocarbons-gasoline by EPA method 8260B.

The results of the analyses are summarized in the enclosed tables. Applicable detection limits and calibration data are included in the tables.

1,1 difluoroethane was used as a leak check compound around the probe rods during the soil vapor sampling. No 1,1 difluoroethane was detected in any of the vapor samples reported at or above the DTSC recommended leak check compound reporting limit of 10 ug/L of vapor.

TEG appreciates the opportunity to have provided analytical services to Versar on this project. If you have any further questions relating to these data or report, please do not hesitate to contact us.

Sincerely,

Mark Jerpbak
Director, TEG-Northern California

Versar Incorporated
Project # 104422.4422.007
2585 Nicholson Street
San Leandro, California

TEG Project #91021D

Analyses of SOIL VAPOR in micrograms per cubic meter of Vapor
BTEX, MtBE, & TPH-gasoline (EPA method 8260B)

SAMPLE NUMBER:		V-2 dup	V-3	V-4	V-5	V-6
SAMPLE DEPTH (feet):		4.5	5.0	5.0	4.0	4.5
PURGE VOLUME:		1	1	1	1	1
COLLECTION DATE:		10/21/09	10/21/09	10/21/09	10/21/09	10/21/09
COLLECTION TIME:		12:32	13:22	13:33	13:57	14:18
DILUTION FACTOR (VOCs):		1	10	10	10	10
	RL					
Benzene	100	49000	530000	610000	380000	890000
Toluene	200	370	4200	420000	320000	42000
Ethylbenzene	100	4900	6800	73000	130000	120000
m,p-Xylene	200	2000	2700	180000	370000	270000
o-Xylene	100	nd	nd	57000	110000	45000
Methyl-t-butyl ether (MtBE)	100	nd	nd	nd	nd	nd
TPH (gasoline range)	10000	3400000	38000000	23000000	11000000	31000000
1,1 Difluoroethane (leak check)	10000	nd	nd	nd	nd	nd
Surrogate Recovery (DBFM)		100%	105%	109%	92%	107%
Surrogate Recovery (1,4-BFB)		98%	96%	98%	99%	100%

'RL' Indicates reporting limit at a dilution factor of 1
'nd' Indicates not detected at listed reporting limits

Analyses performed in TEG-Northern California's lab
Analyses performed by: Mr. Jon Edmondson

11350 Monier Park Place, Rancho Cordova, CA 95742 Phone: (916) 853-8010 Fax: (916) 853-8020

Versar Incorporated
Project # 104422.4422.007
2585 Nicholson Street
San Leandro, California

TEG Project #91021D

Analyses of SOIL VAPOR in micrograms per cubic meter of Vapor
BTEX, MtBE, & TPH-gasoline (EPA method 8260B)

SAMPLE NUMBER:		V-7	V-8	V-9	V-10
SAMPLE DEPTH (feet):		4.5	4.0	5.0	5.0
PURGE VOLUME:		1	1	1	1
COLLECTION DATE:		10/21/09	10/21/09	10/21/09	10/21/09
COLLECTION TIME:		14:39	15:01	15:20	15:40
DILUTION FACTOR (VOCs):		10	1	1	10
	RL				
Benzene	100	210000	nd	5300	190000
Toluene	200	180000	nd	21000	560000
Ethylbenzene	100	42000	nd	5700	63000
m,p-Xylene	200	120000	nd	22000	180000
o-Xylene	100	35000	nd	7600	54000
Methyl-t-butyl ether (MtBE)	100	nd	nd	nd	nd
TPH (gasoline range)	10000	4000000	nd	300000	9000000
1,1 Difluoroethane (leak check)	10000	nd	nd	nd	nd
Surrogate Recovery (DBFM)		103%	105%	104%	107%
Surrogate Recovery (1,4-BFB)		100%	101%	102%	104%

'RL' Indicates reporting limit at a dilution factor of 1
'nd' Indicates not detected at listed reporting limits

Analyses performed in TEG-Northern California's lab
Analyses performed by: Mr. Jon Edmondson

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Versar Incorporated
Project # 104422.4422.007
2585 Nicholson Street
San Leandro, California

TEG Project #91021D

CALIBRATION STANDARDS - Initial Calibration / LCS

Instrument: Agilent 5973N MSD

	INITIAL CALIBRATION		LCS	
COMPOUND	RF	%RSD	RF	%DIFF
Benzene	1.061	12.6%	1.024	3.5%
Toluene	0.719	16.4%	0.664	7.6%
Ethylbenzene	0.569	11.0%	0.541	4.9%
m,p-Xylene	0.704	16.8%	0.668	5.1%
o-Xylene	0.665	13.2%	0.635	4.5%
Methyl-t-butyl ether (MtBE)	0.572	5.3%	0.629	10.0%
TPH (gasoline range)	1.751	17.0%	1.779	1.6%
Acceptable Limits		20.0%		15.0%

Versar Incorporated
Project # 104422.4422.007
2585 Nicholson Street
San Leandro, California

TEG Project #91021D

Analyses of SOIL VAPOR in micrograms per cubic meter of Vapor
BTEX, MtBE, & TPH-gasoline (EPA method 8260B)

SAMPLE NUMBER:		Probe Blank	V-1	V-1	V-1	V-2
SAMPLE DEPTH (feet):			5.0	5.0	5.0	4.5
PURGE VOLUME:			1	3	7	1
COLLECTION DATE:			10/21/09	10/21/09	10/21/09	10/21/09
COLLECTION TIME:		10:26	11:57	11:11	11:35	12:32
DILUTION FACTOR (VOCs):		1	1	1	1	1
	RL					
Benzene	100	nd	37000	19000	18000	35000
Toluene	200	nd	40000	32000	29000	390
Ethylbenzene	100	nd	13000	12000	11000	5700
m,p-Xylene	200	nd	37000	34000	32000	2400
o-Xylene	100	nd	11000	10000	10000	nd
Methyl-t-butyl ether (MtBE)	100	nd	nd	nd	nd	nd
TPH (gasoline range)	10000	nd	1600000	840000	840000	2300000
1,1 Difluoroethane (leak check)	10000	nd	nd	nd	nd	nd
Surrogate Recovery (DBFM)		107%	102%	104%	102%	97%
Surrogate Recovery (1,4-BFB)		104%	100%	101%	101%	102%

'RL' Indicates reporting limit at a dilution factor of 1
'nd' Indicates not detected at listed reporting limits

Analyses performed in TEG-Northern California's lab
Analyses performed by: Mr. Jon Edmondson

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VERSAR

July 15, 2010

Reference: Soil Vapor Assessment
Rodding Cleaning Services
2585 Nicholson Street, San Leandro, CA
Fuel Leak Case No. RO00000020
Versar Project No. 104422.4422.007

PERJURY STATEMENT

As the Environmental Professional (EP) responsible for preparation of this Report, I declare that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct.

PROFESSIONAL GEOLOGIST
TIM BERGER
No. 5225
Exp. 10/31/11
STATE OF CALIFORNIA

7/15/10

Tim Berger, P.G.
Responsible Professional

Date

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