RO 2584

R02

March 29, 2004
Project IA220

Ms. Eva Chu
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-5577

Re: Groundwater Investigation Work Plan
649 Pacific Avenue aka 1701-1713
Alameda, California WEBSTER ST

Dear Ms. Chu:

This **work plan**, prepared by RRM, Inc. (RRM) on behalf of Timber Del Properties, LLC, presents a scope of work to perform groundwater investigation activities at the above referenced site (Figure 1). The purpose of the investigation is to characterize total petroleum hydrocarbons as Stoddard solvent (TPHss) impact to groundwater beneath the site. RRM plans on performing permanent groundwater monitoring well installation using a hollow-stem auger rig. The preparation of this work plan was requested in a letter dated January 26, 2004 prepared by the Alameda County Environmental Health Services (ACEHS) based on recommendations in RRM's *Project Status Letter* dated January 16, 2004 and a Corrective Action Plan (CAP) prepared by Stellar Environmental Solutions, Inc. (Stellar) dated July 31, 2003.

This work plan includes a brief discussion of site description, previous environmental investigation activities, proposed scope of work, and scheduling.

SITE DESCRIPTION

The site is located at the intersection of Pacific Avenue and Webster Street in Alameda, Alameda County, California. The site was formerly the location of a dry cleaner operation beginning in the 1940's and operating until at least 1979. Existing site improvements include a building currently used as a restaurant, sail making business, and a storage space and an adjacent asphalt covered parking lot. Land use in the immediate site vicinity is commercial and residential. Adjacent parcels are occupied by a City of Alameda Fire Station, automotive service businesses, an assisted living home, a vacant parcel, a tailoring and cleaning business (with no on-site cleaning operations), and a martial arts studio. Several former and current gasoline service stations are also located within 1-2 blocks from the site.

SUMMARY OF PREVIOUS INVESTIGATION ACTIVITIES

The following is a summary of environmental work performed at the site. The data discussed below is summarized on tables and figures prepared by Stellar. Copies of selected tables and figures from various reports prepared by Stellar are presented in Attachment A.

On March 8, 2003, Stellar performed subsurface investigation activities at the site; investigation work was reported in Stellar's March 18, 2003 *Subsurface Site Investigation Report*. Four borings, designated BH-01 through BH-04 were advanced at the site. Soils encountered during drilling consisted of base rock fill to approximately 2.5 feet below ground surface (bgs), underlain by a fine-grained sand to a depth of approximately 5.5 feet bgs. The sand layer is underlain by clayey sand to depths ranging from 10 feet bgs to 15 feet bgs, the maximum depth explored. In boring BH-01, the clayey sand was underlain by a medium-grained sand from a depth of approximately 10 feet bgs to 12 feet bgs. Groundwater was encountered at depths ranging from 10 feet bgs to 13 feet bgs in each of the borings. Based on regional topography and information from monitoring activities performed at a site on the corner of Webster Street and Pacific Avenue from 1993 to 1995, groundwater flow at the site is generally west.

Soil samples were collected at depths ranging from 6.5 feet bgs to 12.5 feet bgs; groundwater samples were collected from each of the boreholes. All samples were analyzed in the laboratory for gasoline range and Stoddard solvent range total volatile hydrocarbons (TVHg and TVHss, respectively) and diesel range and motor oil range total extractable hydrocarbons (TEHd and TEHmo, respectively) by Environmental Protection Agency (EPA) Method 8015 modified; benzene, toluene, ethyl benzene, and xylenes (collectively BTEX) and methyl tert-butyl ether (MtBE) by EPA Method 8021B; and volatile organic compounds (VOCs) by EPA Method 8260B. In soil, TVHg were detected in two of the four samples at concentrations of 4.7 parts per million (ppm) and 8,800 ppm. TVHss were detected in two of the four samples at concentrations of 3.1 ppm and 5,800 ppm. The laboratory reported that the TVHg and TVHss results did not match the chromatogram standard for gasoline and Stoddard solvent. BTEX compounds, MtBE, TEHd, and TEHmo were not detected in any of the soil samples collected. No detectable concentrations of VOCs were found in any of the soil samples collected.

In groundwater, TVHg were detected in two of the four samples at concentrations of 360 parts per billion (ppb) and 270 ppb. TVHss were detected at concentrations of 270 ppb and 280 ppb. BTEX compounds were detected in one of the four samples with benzene detected at a concentration of 0.68 ppb. MtBE was detected in three of the four samples at concentrations ranging from 2.1 ppb to 7.4 ppb. TEHd were detected in all four samples at concentrations ranging from 86 ppb to 8,400 ppb. TEHmo were detected in two of the four samples at concentrations of 470 ppb and 2,600 ppb. Groundwater samples contained chloroform in one of four samples at a concentration of 1.0 ppb; trichloroethene (TCE) in two of four samples at concentrations of 1.3 ppb and 1.9 ppb; tetrachloroethene (PCE) in two of four samples at concentrations ranging of 1.9 ppb and 2.6 ppb, trans 1,2-dichloroethene (trans

1,2-DCE) in one of four samples at a concentration of 0.5 ppb and cis 1,2-dichloroethene (cis 1,2-DCE) in one of four samples at a concentration of 0.7 ppb. Four additional borings (BH-05 through BH-08) were advanced at the 1713 Webster Street address, adjacent to the subject site. These borings are outside the area of investigation related to 649 Pacific Avenue, and thus are not discussed by this letter.

Based on the findings of the investigation, Stellar recommended review of additional environmental records to identify the sources of the impact discovered, the advancement of additional borings to define the lateral extent of Stoddard solvent impact, notification of relevant regulatory agencies regarding the findings, and an eventual site closure assessment after completion of additional assessment work.

On March 25, 2003, Stellar performed additional soil sampling along an exposed sanitary sewer trench at the site. This phase of the investigation was reported in Stellar's April 2, 2003 *Report of Soil Analytical Results, Sanitary Sewer Line Trench at 649 Pacific Avenue, Alameda, California*. Soil conditions along the trench were not logged during this phase of the investigation. A total of 9 soil samples were collected along the trench and 1 soil sample was collected from the base of the floor drain leading to the sanitary sewer line. Soil samples from along the sewer trench were collected from two depths at each of four locations. All samples were analyzed for TVHss, BTEX, and MtBE. TVHss was detected in three of the nine samples at concentrations ranging from 960 ppm to 2,700 ppm; all the samples with detected TVHss concentrations were from the lower soil strata at depths ranging from 7.5 feet to 8.0 feet bgs. Trace concentrations of ethyl benzene and xylenes were detected in the same three samples. MtBE was not detected in any of the samples collected.

Remedial investigation activities performed by Stellar between March and July 2003 were documented in Stellar's July 31, 2003 *Site Remedial Investigation Report*. Some of the data discussed in the July 31, 2003 report were previously reported in Stellar's March 18, 2003 and April 2, 2003 reports. The July 31, 2003 report summarized new findings and the findings of these previous investigation activities. A total of 16 additional soil borings were advanced on July 9 and July 10, 2003. Groundwater was encountered at depths ranging from ranging from 10 feet bgs to 13 feet bgs in each of the borings. A total of 14 soil samples collected from the borings were selected for laboratory analyses; samples were analyzed for TVHss, BTEX compounds, and MtBE. Four of the samples were also analyzed for TEH. TVHss were detected in two of the soil samples at concentrations of 17 ppm and 1,900 ppm. TEH range hydrocarbons were detected in three soil samples at concentrations ranging from 9.4 ppm to 3,700 ppm. BTEX compounds and MtBE were not detected in any of the soil samples analyzed. A total of 9 groundwater samples were collected and analyzed for TVHss, BTEX compounds, and MtBE. Four of the groundwater samples were also analyzed for TEH. TVHss were detected in one of the samples at a concentration of 99,000 ppb. TEH were detected in all four samples at concentrations ranging from 100 to 250 ppb. Trace concentrations of toluene (2 samples) and total xylenes (one sample) were detected. MtBE was detected in 7 of the 9 groundwater samples at concentrations ranging from 3.3 ppb to 12 ppb. During July 2003 five additional borings (BH-13, BH-14, and BH-31 through

BH-33) were advanced at the 1713 Webster Street address, adjacent to the subject site. These borings are outside the area of investigation related to 649 Pacific Avenue, and thus are not discussed by this report.

Conclusions and Recommendations from Previous Investigation Activities

Figures 5 and 6 from Stellar's July 31, 2003 report, presented in Attachment A, depict soil and groundwater analytical results from March and July 2003. The figures present isoconcentration contours for combined TVHss and TEH concentrations in soil and groundwater at the site. Because the contamination detected in soil and groundwater at the site generally follows a sanitary sewer line located along the western edge of the 649 Pacific Avenue building and due to the former use of this building for dry cleaning operations, Stellar has attributed the soil and groundwater impact to former uses of the 649 Pacific Avenue building and potential discharges from the sanitary sewer line. After review of investigation data, RRM has also concluded that the sanitary sewer is the most likely source of Stoddard solvent impact at the site.

Based on the findings of investigation activities performed at the site, Stellar prepared a corrective action plan (CAP) dated July 31, 2003. The corrective action for the site proposed by Stellar included excavation of soil from beneath the floor of the 649 Pacific Avenue site. Stellar estimated that approximately 150 tons of impacted soil would be removed during the excavation activities to remove impacted soil to concentrations at or below 100 ppm. Stellar also proposed confirmation soil sampling following the removal of impacted soils. After completion of soil excavation and site restoration activities, Stellar proposed the installation of four groundwater monitoring wells and the performance of quarterly groundwater monitoring activities to confirm the effectiveness of the remedial excavation.

Pursuant to the recommendations made by Stellar and RRM, and approved by ACEHS in a letter dated January 26, 2004, RRM recommends that a soil and groundwater investigation be performed including the installation and quarterly monitoring of 5 groundwater monitoring wells to further evaluate the lateral extent of Stoddard solvent impact, flow direction, gradient, and plume stability at the site.

PROPOSED SCOPE OF WORK

The following tasks detail the scope of work to complete the proposed groundwater investigation.

Permitting

Prior to conducting the fieldwork, RRM will procure all the required permits. Alameda County well installation permits will be required.

Safety and Prefield Procedures

Site safety procedures will involve the preparation of a site-specific health and safety plan identifying potential chemical and physical hazards which may be encountered during the course of field activities. All RRM personnel involved in conducting the field activities will have met OSHA 40 Hour Hazardous Waste Operations and Emergency Response Training.

Before any drilling activity at the site, the site will cleared for underground utilities by notification of Underground Service Alert (USA), review of available station plans and public right-of-way plans. Additionally, a private subsurface utility subcontractor may be utilized.

As part of the health and safety plan, a borehole clearance review form and daily Job Safety Analyses (JSA) sheets will be completed prior to beginning work and before changing work tasks. As outlined in the health and safety plan, a communication stream will be maintained to address any and all safety and project related issues that may arise.

Preparation of Site Building for Interior Work

The 649 Pacific Avenue structure is currently being used for storage of hospital beds, wheel chairs, and other medical equipment. These materials will need to be cleared from the storage space prior to initiation of drilling. In addition, the entrance to the structure is currently a 48-inch doorway built into a former garage door sized opening. RRM will temporarily remove the door frame structure to allow the limited access drilling equipment to access the drilling locations inside the building.

Groundwater Monitoring Well Installations

Based on laboratory analytical results from soil and groundwater samples collected during the previous investigation activities at the site, RRM proposes the advancement of five soil borings for the collection of soil samples and the installation of groundwater monitoring wells. The proposed well locations are shown on Figure 3. Field and analytical procedures are discussed below and further detailed in Attachment B.

- The proposed monitoring wells will be advanced using limited access, hollow-stem auger drilling equipment to a depth of approximately 25 feet bgs or to a depth of approximately 10 feet after groundwater is encountered. A RRM field geologist, based field screening results and direct observations, will determine the total depth and screened interval of each well.
- Five groundwater monitoring wells are proposed to define the lateral extent of TPHss impact to groundwater at the site. Soil samples will be retained from the borings for the wells for lithologic description and possible laboratory analyses.

- Upon completion of well installation work, all monitoring wells will be developed and sampled. All wells will also be surveyed for location and elevation relative to mean sea level.
- Soil and groundwater samples to be analyzed will be submitted to a California state-certified laboratory and analyzed for the presence of TPHss and BTEX compounds.

Reporting: A report documenting the procedures and findings of the site characterization will be prepared and submitted to the ACEHS within 3 to 5 weeks of completion of the fieldwork and receipt of laboratory data. The report will include conclusions and recommendations for further characterization, if necessary.

SCHEDULE

RRM will begin the above scope of work immediately following the approval by the ACEHS. Upon approval, it is anticipated that well installation permits will take up to three weeks to complete and process. Field work will likely begin approximately one to two weeks following the procurement of the necessary permits.

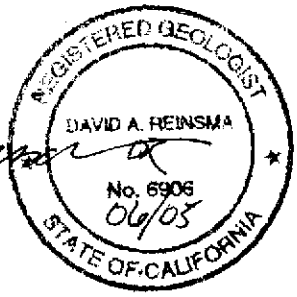
Should you have any questions regarding the contents of this document, please do not hesitate to call RRM at (831) 475-8141.

Sincerely,

RRM, Inc.

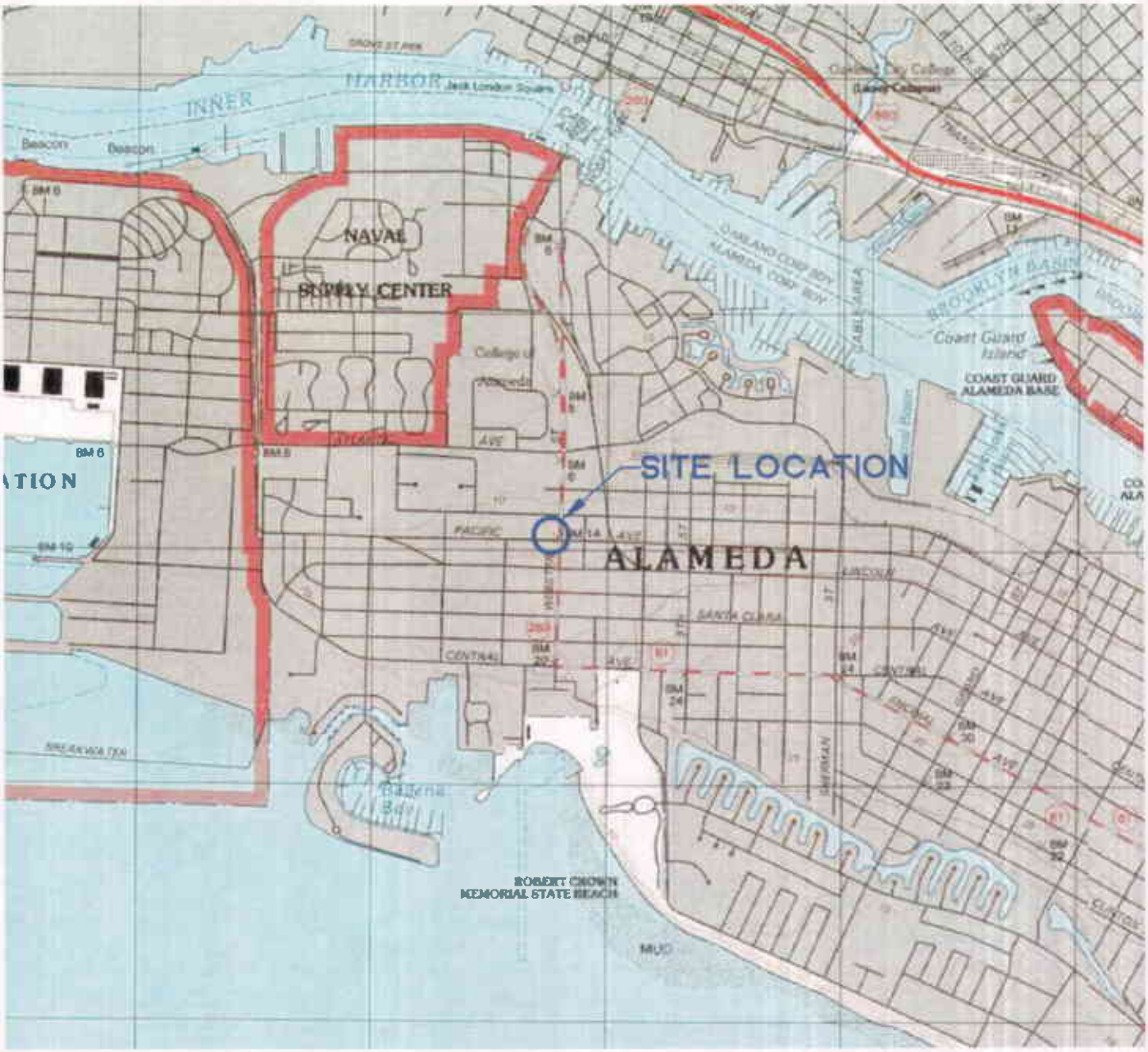
Edward Buskirk
Project Scientist

Dave A. Reinsma
Senior Geologist
RG 6906



Attachments: Figure 1 – Site Location Map
Figure 2 – Extended Site Map
Figure 3 – Proposed Well Location Map
Attachment A – Selected Tables and Figures from March and July 2003 Stellar Environmental Solutions, Inc. Investigation Activities
Attachment B – Field Procedures and Laboratory Methods

cc: Mr. Don Lindsey, Timber Del Properties, LLC, 2424 Central Ave., Alameda, California 94501
Mr. Carl Searway, 3032 Dakota Street, Oakland, California 94602



Ref. IA220/MAP0-SLM.DWG
Base Map from TOPO!! NGH

PREPARED BY	SITE LOCATION MAP	FIGURE: 1
RRM	649 Pacific Avenue Alameda, California	PROJECT: IA220

N

SCALE IN FEET

0 20

COURTYARD AND ASSISTED LIVING

DRAIN

BH-15

BH-16

BH-17

BH-19

BH-18

BH-01

BH-05

BH-08

BH-06

BH-13

1713 WEBSTER
RESTAURANT

1ST FLOOR HALLWAY AND
STAIRS TO 2ND FLOOR
(647 PACIFIC AVE. SPACE)

BH-02

BH-14

BH-32

BH-31

BH-33

BH-21

BH-28

1711 WEBSTER
MARTIAL ARTS
SCHOOL

CITY OF ALAMEDA
FIRE STATION

PARKING
LOT

PROJECT
SITE

653 PACIFIC
VACANT

BH-09

BH-22

BH-25

BH-10

BH-03

BH-26

BH-23

BH-11

BH-30

1707 WEBSTER
TAILORING AND
CLEANING

SIDEWALK

WEBSTER STREET

BH-12

BH-04

BH-27

651 PACIFIC
AUTOMOTIVE
SERVICE

1701 WEBSTER
VACANT

BH-24

BH-20

ELECTRIC
TRANSFORMER

STORAGE
ROOM

649 PACIFIC

MW-6

ENTRY
DOOR

DRIVEWAY

SIDEWALK

EXPLANATION

BH-01 BORING/SOIL SAMPLE LOCATION
(STELLAR, MARCH AND JULY 2003)

MW-6 VACINITY SITE GROUNDWATER WELL

PROPOSED MONITORING WELL LOCATION

PACIFIC AVENUE

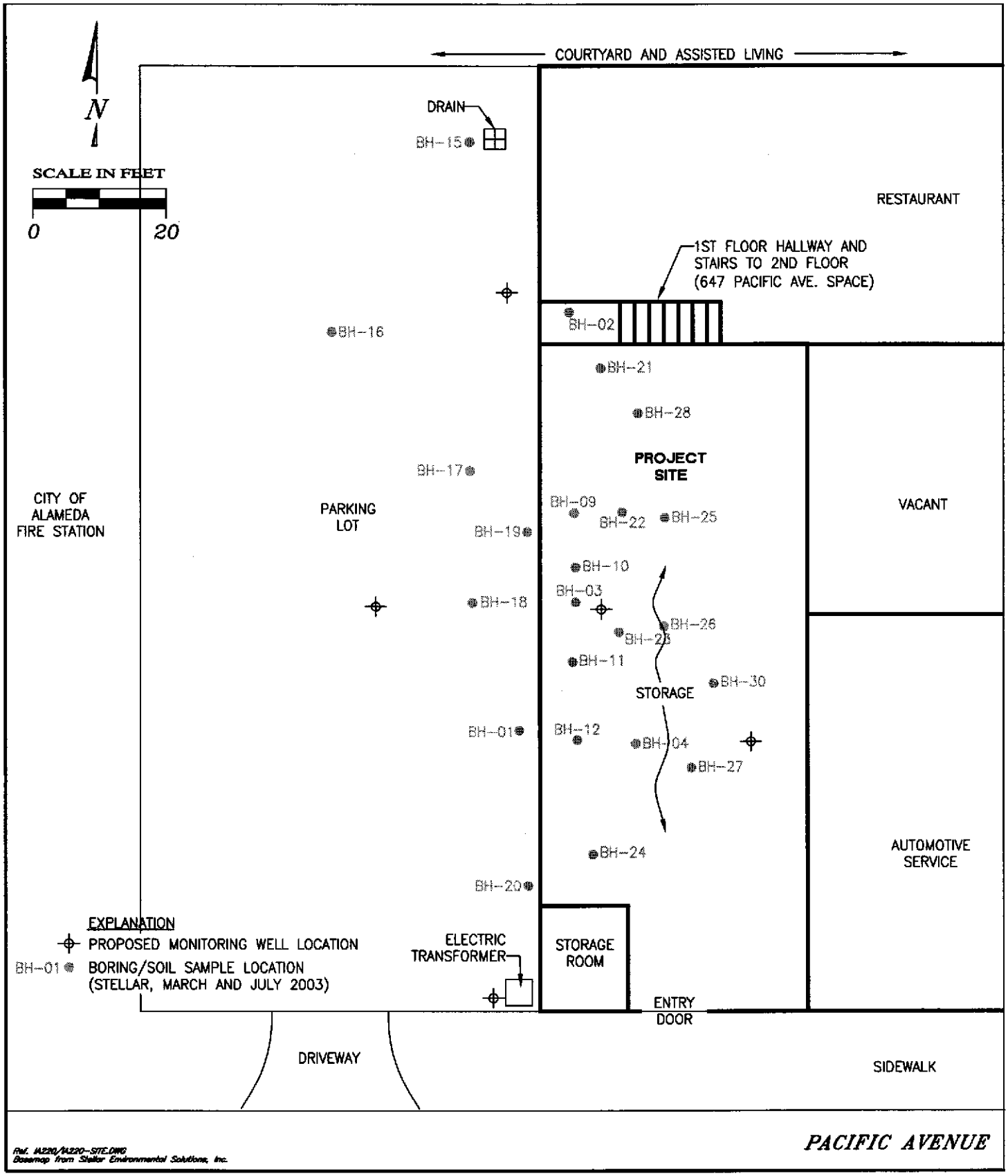
Ref: IA220/IA220-EXTENDD.DWG
Basemap from Stellar Environmental Solutions, Inc.

PREPARED BY RRM ENVIRONMENTAL ENGINEERING GEOLOGY

EXTENDED SITE MAP

649 Pacific Avenue
Alameda, California

FIGURE:
2
PROJECT:
IA220



PREPARED BY

PROPOSED MONITORING WELL LOCATION MAP

649 Pacific Avenue
Alameda, California

FIGURE:
3
PROJECT:
IA220

ATTACHMENT A

SELECTED TABLES AND FIGURES FROM MARCH AND JULY 2003 STELLAR ENVIRONMENTAL SOLUTIONS, INC. INVESTIGATION ACTIVITIES

Table 1
March 2003 Soil and Groundwater Analytical Results
Volatile Organic Compounds
649 Pacific Avenue Subsite, Alameda, California

Sample I.D.	Sample Depth (feet)	Chloroform	TCE	PCE	Trans-1,2-DCE	Cis-1,2-DCE
Soil Analytical Results (µg/kg)						
BH-01-7'	7'	*< 4.6*	*< 4.6*	*< 4.6*	*< 4.6*	*< 4.6*
BH-02-12.5'	12.5'	*< 5.2*	*< 5.2*	*< 5.2*	*< 5.2*	*< 5.2*
BH-03-6.5'	6.5'	*< 130*	*< 130*	*< 130*	*< 130*	*< 130*
BH-04-8'	8'	*< 4.8*	*< 4.8*	*< 4.8*	*< 4.8*	*< 4.8*
Soil RBSLs (b)		*260 / 580 (a)*	*1,500*	*530*	*15,000*	*7,700*
Soil RBSLs (c		*260 / 580 (a)*	*400*	*150 / 530 (a)*	*650*	*190*
Groundwater Analytical Results (µg/L)						
BH-01-GW	10'-12'	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*
BH-02-GW	10'-13'	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*
BH-03-GW	10'-13'	**1.0**	**1.3**	**1.9**	*< 0.5*	*< 0.5*
BH-04-GW	10'-13'	<0.5	**1.9**	**2.6**	**0.5**	**0.7**
Groundwater RBSLs (d)		*28*	*360*	*120*	*590*	*590*
Groundwater RBSLs (e)		*28*	*5.0*	*5.0*	*10*	*6.0*

Notes:

DCE = Dichloroethene.
PCE = Tetrachloroethylene.
RBSLs = Regional Water Quality Control Board Risk-Based Screening Levels (see "Regulatory Considerations" text for applicable criteria)
TCE = Trichloroethylene.
VOCs = Volatile organic compounds.
(a) 1st value is for surface soils (less than 10 feet deep); 2nd value is for subsurface soils (greater than 10 feet deep).
(b) For commercial/industrial sites where groundwater is not a current or potential drinking water source.
(c.) For commercial/industrial sites where groundwater is a current or potential drinking water source
(d) For commercial/industrial sites where a drinking water resource is not threatened.
(e) For commercial/industrial sites where a drinking water resource is threatened.
Table includes only detected compounds. See Appendix E for full list of analytes.

Table 2
March - July 2003 Soil Analytical Results
Petroleum and Aromatic Hydrocarbons
649 Pacific Avenue Subsite, Alameda, California
(All soil analytical results reported as mg/kg)

Sample I.D.	Date Sampled	Sample Depth (feet)	TVHss	TEH	TPH	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
BH-01-7'	3/8/03	7'	*< 1.1*	*NA*	--	*< 0.0051*	*< 0.0051*	*< 0.0051*	*< 0.0051*	*< 0.020*
BH-02-12.5'	3/8/03	12.5'	*< 1.1*	*< 5.0*	*< 5.0*	*< 0.0053*	*< 0.0053*	*< 0.0053*	*< 0.0053*	*< 0.021*
BH-03-6.5'	3/8/03	6.5'	**5,800**	*NA*	--	*< 1.3*	*< 1.3*	*< 1.3*	*< 1.3*	*< 5.0*
BH-04-8'	3/8/03	8'	**3.1**	*NA*	--	*< 0.0054*	*< 0.0054*	*< 0.0054*	*< 0.0054*	*< 0.022*
Floor Drain Base	3/25/03	3'	*< 1.0*	*NA*	--	*< 0.0050*	*< 0.0050*	*< 0.0050*	*< 0.0050*	*< 0.020*
BH-9-2'	3/25/03	2'	*< 1.0*	*NA*	--	*< 0.0052*	*< 0.0052*	*< 0.0052*	*< 0.0052*	*< 0.021*
BH-9-7.5'	3/25/03	7.5'	*< 0.98*	*NA*	--	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.020*
BH-10-2.5'	3/25/03	2.5'	*< 1.0*	*NA*	--	*< 0.0051*	*< 0.0051*	*< 0.0051*	*< 0.0051*	*< 0.020*
BH-10-7.5'	3/25/03	7.5'	**2,700 (a)**	*NA*	--	*< 0.0051*	<0.0051	**0.26**	**0.22**	*< 0.020*
BH-11-2.5'	3/25/03	2.5'	*< 1.0*	*NA*	--	*< 0.0048*	*< 0.0048*	*< 0.0048*	*< 0.0048*	*< 0.019*
BH-11-8'	3/25/03	8'	**2,000 (a)**	*NA*	--	*< 0.0054*	*< 0.0054*	**0.88**	*< 0.0054*	*< 0.022*
BH-12-3'	3/25/03	3'	*< 0.98*	*NA*	--	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.020*
BH-12-7.5'	3/25/03	7.5'	**960 (a)**	*NA*	--	*< 0.0052*	*< 0.0052*	**0.084**	**0.31**	*< 0.021*
BH-17-8'	7/9/03	8'	*< 1.1*	*NA*	--	*< 0.0053*	*< 0.0053*	*< 0.0053*	*< 0.0053*	*< 0.021*
BH-18-8'	7/9/03	8'	*< 0.95*	*NA*	--	*< 0.0048*	*< 0.0048*	*< 0.0048*	*< 0.0048*	*< 0.019*
BH-19-8'	7/9/03	8'	*< 1.0*	*NA*	--	*< 0.0051*	*< 0.0051*	*< 0.0051*	*< 0.0051*	*< 0.020*
BH-20-7.5'	7/9/03	7.5'	*< 1.1*	*NA*	--	*< 0.0054*	*< 0.0054*	*< 0.0054*	*< 0.0054*	*< 0.022*

(Table continued on next page)

Table 2 (continued)

Sample I.D.	Date Sampled	Sample Depth (feet)	TVHss	TEH	TPH	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
BH-21-8'	7/10/03	8'	*< 0.97*	*NA*	--	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.019*
BH-22-8'	7/10/03	8'	*< 0.98*	**5.2**	**5.2**	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.020*
BH-24-7'	7/10/03	7'	*< 1.0*	*NA*	--	*< 0.0050*	*< 0.0050*	*< 0.0050*	*< 0.0050*	*< 0.020*
BH-25-9'	7/10/03	9'	*< 1.0*	*NA*	--	*< 0.0052*	*< 0.0052*	*< 0.0052*	*< 0.0052*	*< 0.021*
BH-26-8'	7/10/03	8'	**1,900**	*NA*	--	*< 0.50*	*< 0.50*	*< 0.50*	*< 0.50*	*< 2.0*
BH-28-8'	7/10/03	8'	*< 0.97*	*NA*	--	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.019*
BH-29-8'	7/10/03	8'	*< 1.1*	*< 1.0*	*< 1.1*	*< 0.0053*	*< 0.0053*	*< 0.0053*	*< 0.0053*	*< 0.021*
BH-30-8'	7/10/03	8'	*< 0.97*	*NA*	--	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.0049*	*< 0.019*
Soil RBSLs (b)			400	400	400	0.39	8.4	24	1.0	1.0
Soil RBSLs (c.)			100	100	100	0.045	2.6	2.5	1.0	0.028

Notes:

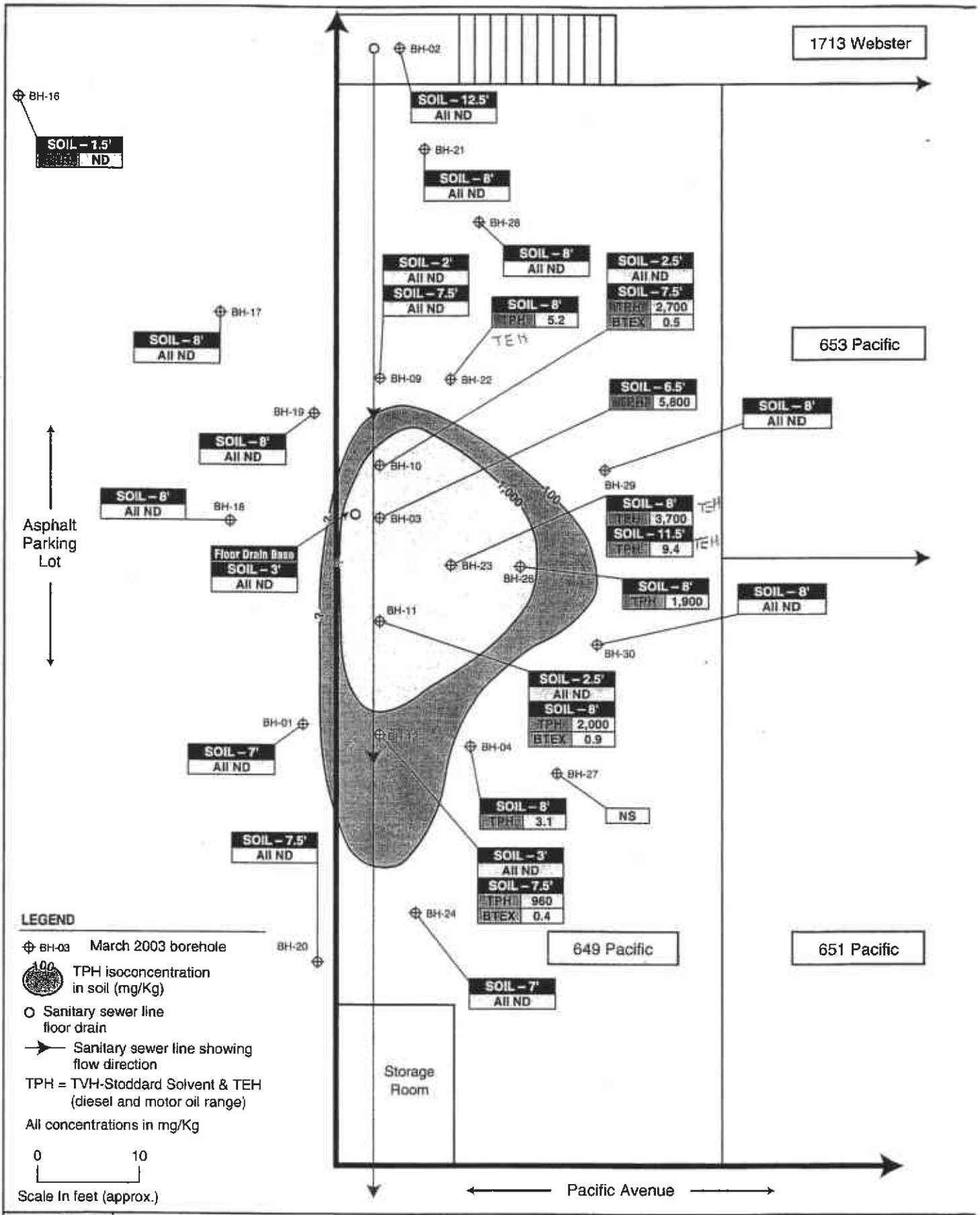
NA = Sample not analyzed for this contaminant.
ND = Not detected (multiple method reporting limits, see Appendix E).
RBSLs = Regional Water Quality Control Board Risk-Based Screening Levels (see "Regulatory Considerations" text for applicable criteria)
TEH = Total extractable hydrocarbons (diesel- through motor oil- ranges).
TVHss = Total volatile hydrocarbons - Stoddard Solvent range.
TPH = Total Petroleum Hydrocarbons = TVHss + T.EH (when both analyses were run)
(a) See laboratory case narrative regarding quantification of TVH.
(b) For surface soil (< 10 feet deep) at commercial/industrial sites where groundwater is not a current or potential drinking water source.
(c) For surface soil (< 10 feet deep) at commercial/industrial sites where groundwater is a current or potential dinking water source.

Table 3
March - July 2003 Groundwater Analytical Results
Petroleum and Aromatic Hydrocarbons
649 Pacific Avenue Subsite, Alameda, California
(All groundwater analytical results reported as µg/L.)

Sample I.D.	Date Sampled	Sample Depth (feet)	TVHss	TEH	TPH	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
BH-01-GW	3/8/03	10'-12'	< 50	760	760	< 0.5	< 0.5	< 0.5	< 0.5	7.4
BH-02-GW	3/8/03	10'-13'	< 50	86	86	< 0.5	< 0.5	< 0.5	< 0.5	2.1
BH-03-GW	3/8/03	10'-13'	270	9,600	9,870	0.68	110	1.6	9.4	< 2.0
BH-04-GW	3/8/03	10'-13'	280	8,400	8,680	< 0.5	< 0.5	< 0.5	< 0.5	2.2
BH-17-GW	7/9/03	10'-11'	< 50	NA	--	< 0.5	< 0.5	< 0.5	< 0.5	4.5
BH-18-GW	7/9/03	10'-11'	< 50	NA	--	< 0.5	< 0.5	< 0.5	< 0.5	11
BH-19-GW	7/9/03	10'-11'	< 50	NA	--	< 0.5	< 0.5	< 0.5	< 0.5	12
BH-20-GW	7/9/03	10'-11'	< 50	140	140	< 0.5	< 0.5	< 0.5	< 0.5	5.1
BH-22-GW	7/10/03	10'-11'	< 50	130	130	< 0.5	< 0.5	< 0.5	< 0.5	5.3
BH-26-GW	7/10/03	10'-11'	99,000	NA	--	< 0.5	< 0.5	< 0.5	4.2	< 2.0
BH-28-GW	7/10/03	10'-11'	< 50	250	250	< 0.5	0.58	< 0.5	< 0.5	4.2
BH-29-GW	7/10/03	~ 10.5'	< 50	100	100	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
BH-30-GW	7/10/03	~ 10'	< 50	NA	--	< 0.5	0.63	< 0.5	< 0.5	3.3
Groundwater RBSLs (a)			500	500	500	46	130	290	13	1,800
Groundwater RBSLs (b)			100	100	100	1.0	40	30	13	5.0

Notes:

NA = Sample not analyzed for this contaminant. ND = Not detected (multiple method reporting limits, see Appendix E).
RBSLs = Regional Water Quality Control Board Risk-Based Screening Levels (see "Regulatory Considerations" text for applicable criteria)
TEH = Total extractable hydrocarbons (diesel through motor oil- ranges).
TVHss = Total volatile hydrocarbons - Stoddard Solvent range. See laboratory case narrative regarding quantification of TVH.
TPH = Total Petroleum Hydrocarbons = TVHss + TE.H
(a) For commercial/industrial sites where a drinking water resource is not threatened. (b) For commercial/industrial sites where a drinking water resource is threatened.



BOREHOLE LOCATIONS & SOIL ANALYTICAL RESULTS

649 Pacific Avenue
Alameda, CA

By: MJC

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Figure 5

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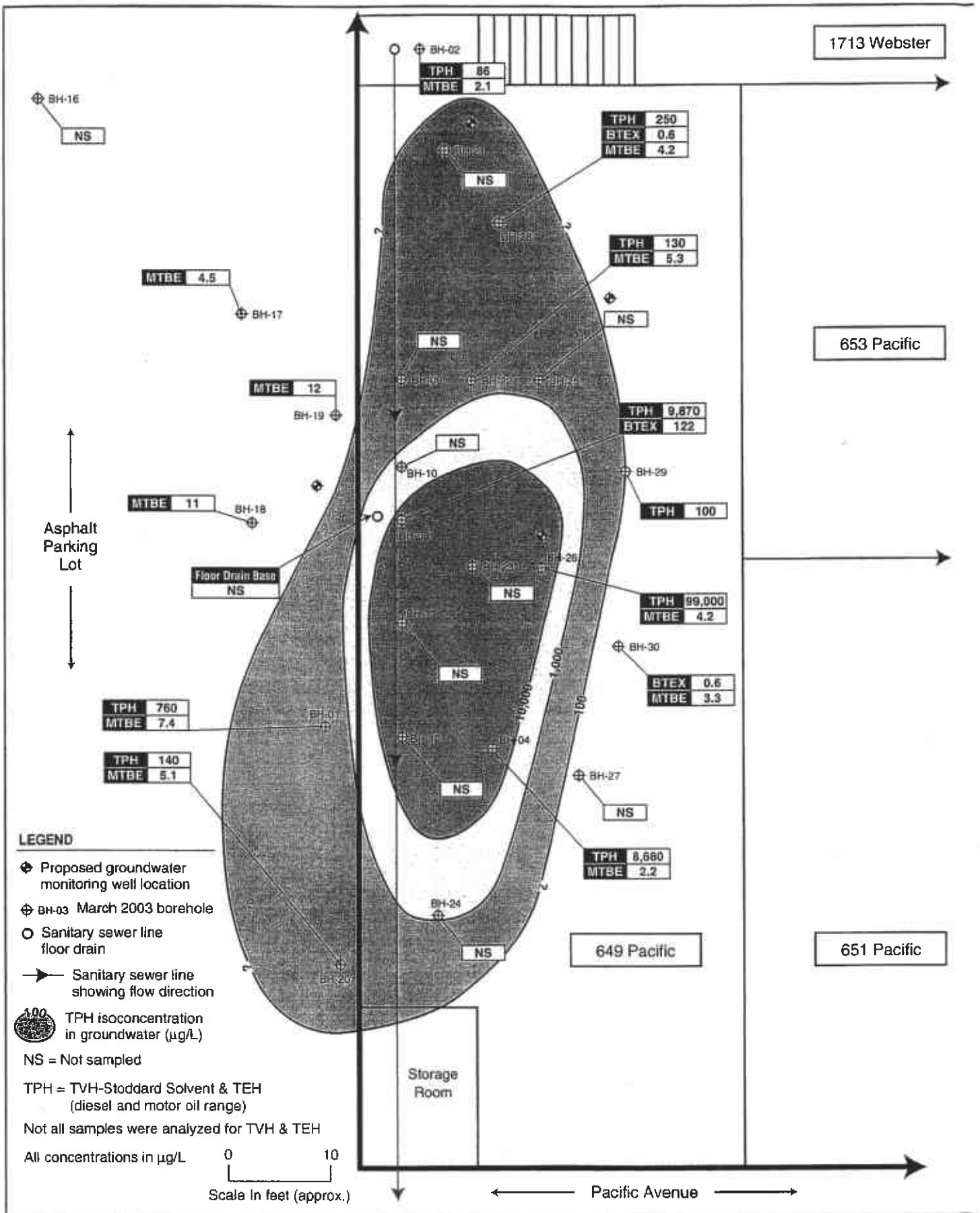

BOREHOLE LOCATIONS, GROUNDWATER ANALYTICAL RESULTS AND PROPOSED WELL LOCATIONS

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Figure 6

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ATTACHMENT B

FIELD PROCEDURES AND LABORATORY METHODS

ATTACHMENT B
FIELD PROCEDURES AND LABORATORY METHODS

Soil Boring Procedures

The soil borings will be advanced using 6-inch diameter limited access, hollow-stem auger drilling equipment. An RRM, Inc. geologist under the direction of a State of California Registered Geologist will log the soil borings using the Unified Soil Classification System and standard geologic techniques. Soil samples for lithologic interpretation and possible chemical analyses will be continuously cored (starting at approximately 5 feet, bgs) using cleaned, 2-inch diameter brass liners. The liners for intervals intended for laboratory analyses will be capped with Teflon, plastic end caps, placed in sealable plastic bags, and then be stored in iced coolers and transported to a state certified laboratory, with chain-of-custody documentation

Upon completion of all soil-sampling activities, the soil borings will be converted to monitoring wells as detailed below. Drilling and sampling equipment was steam-cleaned or cleaned with tri-sodium phosphate solution prior to and between uses.

Groundwater Monitoring Well Installation

Groundwater monitoring wells will be constructed to monitor discrete water bearing strata. Well construction information will be denoted on the boring logs in the field. Well construction materials will consist of a cement grout or bentonite bottom seal (if necessary), 2-inch diameter flush-threaded Schedule 40 PVC casing and factory-prepared pre-packed well screen and filter pack, a cement grout surface seal, and a locking cap and protective vault box.

The well screen and filter pack will extend from the maximum depth of approximately 25 feet bgs to approximately 15 feet bgs, with solid casing extending to the ground surface. A 6-inch thick bentonite seal will then be placed on top of the sand pack, with cement grout placed on top of the bentonite seal extending to the ground surface. A traffic proof well vault box will then be placed over the wells. After well completion, well elevations will be surveyed to the nearest 0.01-foot relative to mean sea level datum and well locations will be measured using GPS equipment by a licensed surveyor.

Organic Vapor Procedures

Soil samples collected during drilling activities will be analyzed in the field for concentrations of volatile organic compounds using a Gas-Tech model GT200 portable gas monitor. The test procedure involves placement of the soil sample in a clean plastic bag. The bag is then warmed for approximately 20 minutes, pierced, and the head-space within the bag tested for total organic vapor measured in parts per million volume as isobutylene. The instrument will be calibrated

prior to field use. The results of the field testing will be noted on the boring logs. These field measurements will aid in the selection of soil samples for chemical analysis.

Well Development/Groundwater Sampling

Well development will be performed utilizing surge block/swab and groundwater extraction techniques. Well development will be performed until the majority of suspended fines are removed or until approximately ten casing volumes are removed. Well development documentation consists of recording data including: time, groundwater and total well depth, turbidity, gallons removed, and well stabilization parameters (pH, conductivity, temperature). Development and purge waters will be stored on site in 55-gallon drums pending proper disposal at a California State-licensed facility.

Groundwater sampling procedures will consist of initially measuring and documenting the water level in each well and checking each well for the presence of separate-phase hydrocarbon (SPH) using an oil/water interface probe or a clear Teflon bailer. The wells that do not contain SPH will then be purged a minimum of three casing volumes or until dry. During purging, well stabilization parameters (temperature, pH, and electrical conductivity) will be monitored. After 80% recovery of the water levels, groundwater samples will be collected with new Teflon bailers or disposable bailers and placed into the appropriate EPA-approved containers. Sampling equipment will be cleaned with tri-sodium phosphate solution between uses. The samples will be labeled, logged onto chain-of-custody documents, and transported on ice to the laboratory using appropriate chain-of-custody documentation.

Laboratory Procedures

Selected soil and groundwater will be analyzed by a California State-certified mobile laboratory for the presence of total petroleum hydrocarbons calculated as Stoddard solvent (TPHss) in accordance with EPA Method 8015 (Modified) and benzene, toluene, ethyl benzene, and xylenes (collectively BTEX) in accordance with EPA Method 8020.