Weiss Associates *Environmental and Geologic Services*

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September 18, 1996

STID
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Dale Klettke
Hazardous Materials Specialist
Alameda County
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94501

RE: Investigation Workplan for 489 43rd Street,
Oakland, California
WA Job # 138-1231-01

Dear Mr. Klettke:

On behalf of Mr. Ronn Simpson, owner of the property at 489 43rd Street, Oakland, California, Weiss Associates (WA) is submitting this subsurface investigation workplan for the above referenced site. You requested a subsurface investigation in your August 20, 1996 letter to Mr. Simpson following the removal of an underground storage tank (UST) beneath the sidewalk of 43rd Street. The investigation objective is to determine if petroleum hydrocarbons are present in soil and ground water at the site. Tests will also be conducted on identified petroleum hydrocarbons to determine if petroleum hydrocarbons released from former USTs at 490 43rd Street may have migrated onto the 489 43rd Street site. The site summary and soil and ground water monitoring data for 490 43rd Street are presented in Appendix A. A site summary and WA's proposed scope of work for 489 43rd Street are presented below.

Site Summary

Former UST Location: The former UST site is located under the north sidewalk of 489 43rd Street, about 90 feet east of the intersection of 43rd Street and Telegraph Avenue in Oakland, California. The site is approximately 90 feet above mean sea level.

UST Installation: The UST was apparently installed prior to 1975 to fuel delivery vehicles for the Liberty French Baking Company, a prior occupant of 489 43rd Street. The exact installation date is unknown.

1995 UST Removal: In September 1995, Acutite Environmental Engineering removed the UST. Up to 1,900 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G), 0.2 ppm benzene, and 1.6 ppm methyl tertiary-butyl ether (MTBE) were detected in soil 10.5-13 feet below surface grade, approximately 1-1.5 feet beneath the UST (Table 1). MTBE was detected in three soil samples and increased with depth. No subsurface investigations have taken place since the tank removal.

Proposed Scope Of Work

WA proposes to auger an 11-foot deep boring downgradient of the UST near 489 43rd Street as shown in Figure 1. The objective of the boring is to collect soil and ground water samples to assess if the UST was a source of petroleum hydrocarbons to the subsurface and if petroleum hydrocarbons from former USTs at 490 43rd Street, the property adjacent and upgradient of 489 43rd Street, that have migrated onto the site. The proposed scope of work to achieve these objectives is described in detail below. WA's standard field procedures are presented in Attachment B.

Permits: A boring permit will be obtained from the Alameda County Zone 7 Water Agency.

Soil Boring and Grouting: The soil boring will be hand-augered or augered with limited access drilling equipment. Soil samples will be collected at least every 5 feet for lithologic description and possible laboratory analyses. The boring will be backfilled with a bentonite seal.

Soil Analyses: Selected soil samples will be analyzed for TPH-G by modified EPA Method 8015 and BTEX by EPA Method 8020. Samples will also be analyzed for TPH as paint thinner by modified EPA method 8015 in order to assess if paint thinner has migrated from former USTs at 490 43rd Street.

Ground Water Sampling: After the boring reaches the water table, the boring will be purged of at least three times the volume of the boring between the water table and the bottom of the boring. Thereafter, a bailer will be lowered gently to collect the water samples. The water will be decanted into the appropriate sample containers.

Ground Water Analyses: Selected ground water samples from the boring will be analyzed for TPH-G, TPH as paint thinner, BTEX, and MTBE.

Reporting: A final report that presents the results of the investigation will be submitted to your agency. The report will include the boring location, a lithologic log, depth-to-water and analytic data.

Schedule

This investigation will be conducted after receiving your written approval of this workplan. A report will be submitted after all field work is completed and the analytic data is compiled.

Please call us if you have any questions.

Sincerely,
Weiss Associates

Delphine Prevost
Staff Geologist

Jerry McHugh, PE
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
JERRY McHUGH
No. C 46740
Exp. 6/97
CIVIL
STATE OF CALIFORNIA

Enclosures Attachment A - Site History (490 43rd Street)
Attachment B - Standard Field Procedures

cc: Ronn Simpson, 4228 Telegraph Avenue, Oakland, California

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Table 1: Analytic Results for Soil - 489 43rd Street, Oakland, California

Soil		Parts per Million (ppm)							
Sample	**Depth (ft)**	**MTBE**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**TPH-G**	**TPH-D**	**Total lead**
GAW-1-10 5'	10.5	0.068	0.2	0.46	1.4	10	150	140	14
GAE-1-11'	11	0.016	0.09	0.13	0.28	1.5	140	160	10
GAM-1-13'	13	1.6	<0.025	0.19	17	48	1,900	1,300	14
STOK-1	stock pile	<0.005	<0.005	0.024	0.05	0.3	13	24	18

Date Sampled: September 18, 1995

Weiss Associates

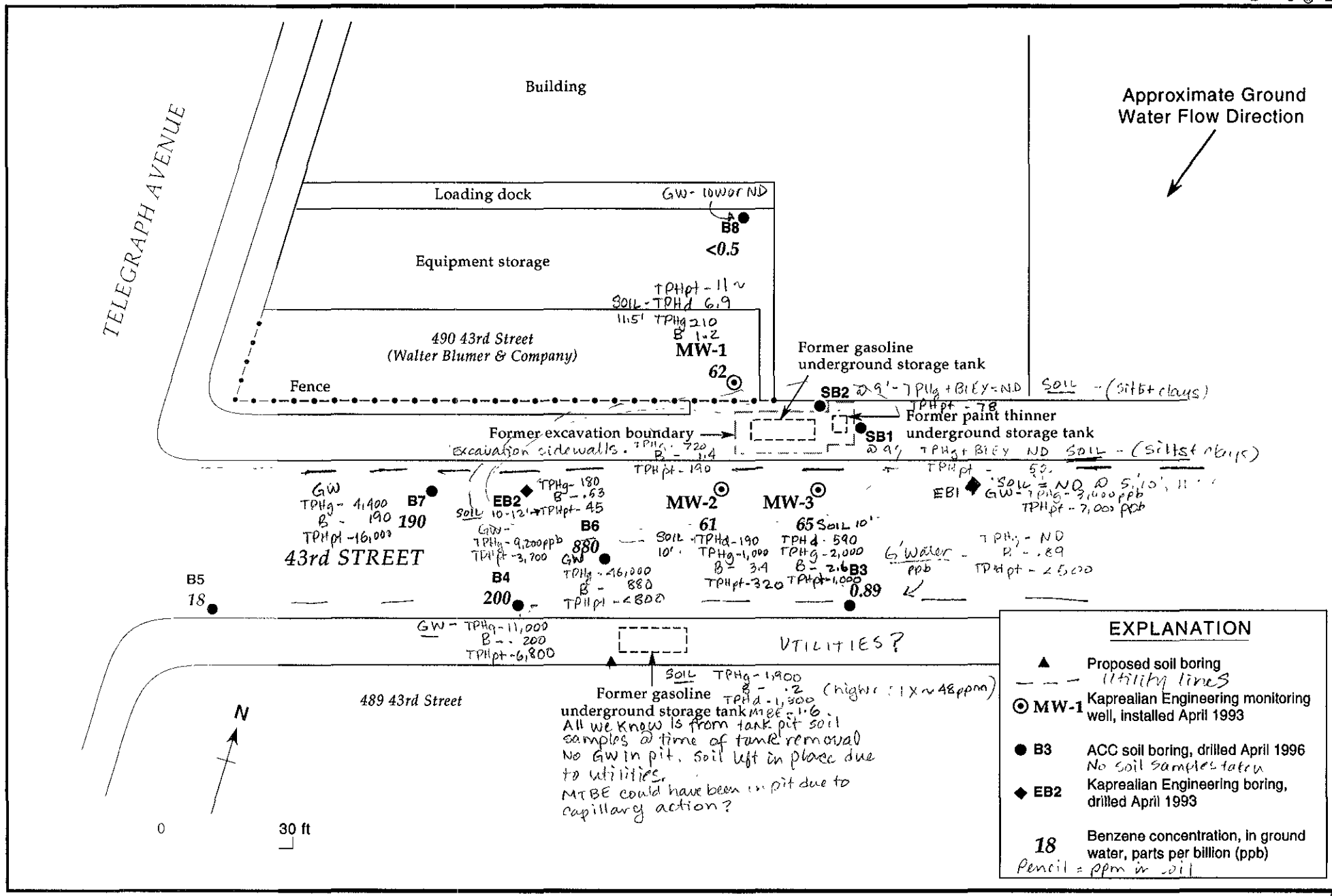

Figure 1 Monitoring Well and Soil Boring Locations - 490 43rd Street, Oakland, California

Notes: ① Utility lines may have created preferential pathways on both sides of street
② Soil contamination is mainly 10-12' - within V.

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ATTACHMENT A

SITE HISTORY (490 43RD STREET)

Site History and Soil and Groundwater Monitoring Data - 490 43rd Street

Tank Removals:	In December 1991, one 1000-gallon gasoline tank and one 350-gallon paint thinner tank were removed from beneath 43rd Street adjacent to 489 43rd Street. Soil samples from underneath the gasoline tank contained up to 490 ppm TPH-G.
1993 Subsurface Investigations:	In April 1993, Kaprealian Engineering, Inc., (KEI) installed 3 ground water monitoring wells (MW-1, MW-2, and MW-3) adjacent to the former USTs.
Quarterly Groundwater Monitoring:	The water table has fluctuated from about 9.6 feet to 12.4 feet below ground surface since 1994. Ground water has flowed south to southwest at a gradient of 0.01 foot/foot since 1993 based on the depth-to-water data. Ground water at the site has been sampled quarterly since 1993 for TPH-G, TPH as paint thinner, and BTEX This data is included in this attachment. Less than 50 parts per billion (ppb) TPH-G, up to 65 ppb benzene, and less than 5.0 ppb MTBE have been detected within the last year (Table 2).
1996 Ground water Sampling:	In April 1996, ACC Environmental Consultants drilled soil borings (SB1 and SB2) near the tank to characterize the soil near the former USTs and borings B3 through B8 to further delineate the extent of impacted shallow ground water. ACC indicated that petroleum hydrocarbons appeared to be migrating off-site, across 43rd Street, in the direction of 489 43rd Street. Site lithology is primarily clay fill 3-5 feet deep, underlain with fine sand.

Table 2: Analytic Results for Soil and Groundwater - 490 43rd Street, Oakland, California

Date Sampled: April 1996 - SB1-SB2, B3-B8
Date Sampled May 1996 MW1-MW3

Soil		Parts per Million (ppm)						
Sample	**Depth (ft.bgs)**	**MTBE**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**TPH-G**	**TPH Thinner**
SB1-9'	9	ns	<0.1	<0.1	<0.1	0.54	<100	52
SB2-9'	9	ns	<0.5	<0.5	<0.5	<0.5	<500	78

Groundwater		Parts per Million (ppm)						
Sample	**Depth (ft.bgs)**	**MTBE**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**TPH-G**	**TPH Thinner**
B3-W	15-19	ns	0.89	1.6	<0.50	0.91	<50	<500
B4-W	15-19	ns	200	66	220	96	11,000	6,800
B5-W	15-19	ns	18	18	32	56	5,300	12,000
B6-W	15-19	ns	880	<0.50	160	180	46,000	<800
B7-W	15-19	ns	190	14	130	100	4,400	16,000
B8-W	15-19	ns	<0.50	0.97	<0.50	1.8	<50	<500
Sample	**Depth (ft.bgs)***	**MTBE**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**TPH-G**	**TPH Thinner**
MW1	10.23	<5	62	<0.5	16	18	<50	240
MW2	10.01	<5	61	5.1	28	11	<50	4,400
MW3	9.97	<5	65	1.5	9	5.1	<50	2,900

ns - not sampled
*Depth is depth to water measured below top of well casing

TABLE 1 - GROUNDWATER MONITORING DATA

Well Number	Date	Depth to Water*	Groundwater Elevation
MW-1 (91.02')	04/14/94	11.19	79.83
	05/23/94	10.75	80.27
	06/16/94	11.72	79.30
	04/12/95	9.72	81.31
	05/10/95	10.11	80.91
	06/28/95	10.91	80.11
	12/05/95	12.21	78.81
	05/30/96	10.23	80.79
MW-2 (90.55')	04/14/94	10.95	79.60
	05/23/94	10.52	80.03
	06/16/94	11.49	79.06
	04/12/95	9.59	80.96
	05/10/95	10.00	80.55
	06/28/95	10.95	79.60
	12/05/95	12.34	78.21
	05/30/96	10.01	80.54
MW-3 (90.90')	04/14/94	11.23	79.67
	05/23/94	10.74	80.16
	06/16/94	11.81	79.09
	04/12/95	9.72	81.18
	05/10/95	10.16	80.74
	06/28/95	10.99	79.91
	12/05/95	12.39	78.51
	05/30/96	9.97	80.93

Notes: *Depth to water measured in feet below top of casing.
(91.02') = Surveyed elevations to the top of the PVC casing

3.2 Groundwater Gradient

The groundwater flow direction as determined from monitoring well data collected on May 30, 1996, is illustrated on Figure 3. Based on groundwater elevation calculations, groundwater flow is predominantly toward the southwest at an average gradient of 0.014 foot/foot. Historic groundwater gradient at the site is summarized in Table 2.

TABLE 2 - GROUNDWATER GRADIENT AND FLOW DIRECTION

Date Monitored	Average Gradient (foot/foot)	Direction
04/14/94	0.007	south
05/23/94	0.008	south
06/16/94	0.007	south
04/12/95	0.010	south-southwest
05/10/95	0.011	south-southwest
06/28/95	0.010	south-southwest
12/05/95	0.020	south-southwest
05/30/96	0.014	southwest

Groundwater elevation fluctuated in each well since December 1995: water in well MW-1 increased 2 feet, well MW-2 increased 2.3 feet, and well MW-3 increased 2.4 feet. Groundwater elevations around well MW-2 are somewhat radial, possibly indicating influence from the excavation or adjacent utility trenches.

3.3 Groundwater Sampling

Before groundwater sampling, each well was purged using a disposable polyethylene bailer. Groundwater samples were collected when temperature, pH, and conductivity of the water stabilized and a minimum of four well casing volumes of water had been removed. Following purging, each well was allowed to recharge before sampling. When recovery to 80 percent of the static water level was observed, a sample was collected for analysis. When recovery to 80 percent of the static water level was estimated to exceed 2 hours, a sample was collected when sufficient volume was available to fill the sample containers. Groundwater conditions were monitored during purging and sampling. A copy of the well monitoring worksheet is presented as Appendix 1.

Water purged during the development and sampling of the monitoring wells was temporarily stored on site in Department of Transportation approved 55-gallon drums pending laboratory analysis and proper disposal.

4.0 RESULTS OF GROUNDWATER SAMPLING

Groundwater samples collected from the groundwater monitoring wells were submitted to Chromalab, Inc . (Chromalab) in Pleasanton, California, following chain of custody protocol. Groundwater samples collected from the wells were analyzed for TPHg and TPH as paint thinner using EPA Method 8015 Modified, and BTEX and methyl tertiary butyl ether (MTBE) using EPA

Method 8020. A copy of the chain-of custody record and laboratory analytical reports is included as Appendix 2.

Concentrations of TPHg were not detected in the water samples collected from wells MW-1 through MW-3, but varying concentrations of BTEX constituents were detected.

Due to the high toluene content of many paint thinners, ACC included a comment regarding the possible presence of a mixture of gasoline and paint thinner on the chain of custody. ACC believes this comment allowed the laboratory to include appropriate quality control measures to avoid including paint thinner components when calculating BTEX analytical results or BTEX components when calculating paint thinner analytical results.

ACC discussed the analytical results with Chromalab and we are satisfied the laboratory analytical results are representative. Chromalab stated that standard procedures are followed when both gasoline and paint thinner are suspected in a sample to avoid "double counting" since the constituents overlap on a chromatogram. ACC believes "double counting" may have occurred in previous sampling events, which resulted in erroneously high values.

Groundwater sample analytical results are summarized in Table 3.

TABLE 3 - GROUNDWATER SAMPLE ANALYTICAL RESULTS

Well / Date	TPH Thinner	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-1							
04/29/93	600	290	31	1.9	2.7	5.4	--
12/13/93	820	1,700	170	22	19	48	--
06/16/94	1,200	2,100	250	12	27	38	--
09/13/94	73	170	6.6	1.6	2.4	3.3	--
12/08/94	170	420	16	3.0	2.9	2.7	--
03/14/95	65	630	39	ND	7.0	8.6	--
06/28/95	130	720	100	7.8	23	32	--
10/13/95	900	290	8.6	0.55	2.8	1.4	--
12/05/95	70	94	5.6	ND	0.67	0.53	--
05/30/96	240	<50	62	<0.5	16	18	<5

Well / Date	TPH Thinner	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-2							
04/29/93	4,100	11,000	2,400	51	76	160	--
12/13/93	2,600	11,000	1,400	66	150	94	--
06/16/94	11,000	18,000	2,100	ND	200	70	--
09/13/94	5,400	12,000	1,400	50	200	89	--
12/08/94	3,200	11,000	1,700	34	200	86	--
03/14/95	670	14,000	1,500	41	160	66	--
06/28/95	8,700	11,000	1,700	ND	230	78	--
10/13/95	1,500	9,400	1,200	41	200	61	--
12/05/95	24,000	150,000	890	200	720	500	--
05/30/96	4,400	<50	61	5.1	28	11	<5
MW-3							
04/29/93	5,800	8,500	840	17	40	42	--
12/13/93	3,500	6,200	580	120	65	120	--
06/16/94	4,700	7,700	910	ND	86	50	--
09/13/94	8,700	6,800	430	14	45	37	--
12/08/94	2,100	1,500	820	ND	52	28	--
03/14/95	480	5,600	250	11	25	30	--
06/28/95	2,100	14,000	650	18	70	54	--
10/13/95	430	2,500	270	1.9	15	10	--
12/05/95	5,400	4,200	250	ND	26	ND	--
05/30/96	2,900	<50	65	1.5	9.0	5.1	<5

Notes: All water results are reported in µg/L (parts per billion)
ND= Not detected at laboratory reporting limit (see analytical report)

5.0 DISCUSSION

Following the approved sampling protocol, all three groundwater monitoring wells were monitored and sampled. The May 30, 1996, sampling event indicated that the concentrations of TPHg decreased approximately two-fold in well MW-1, 3,000-fold in well MW-2, and 80-fold in well MW-3 since the December 1995 sampling event. Concentrations of TPH as paint thinner increased approximately three-fold in well MW-1, decreased five-fold in well MW-2, and decreased two-fold in well MW-3 since December 1995. Benzene increased approximately 10-fold in well MW-1 but decreased 15-fold in well MW-2 and four-fold MW-3.

Groundwater gradient appears to vary slightly across the site, averaging approximately 0.014 foot/foot, and groundwater elevation contours are somewhat radial around well MW-2. ACC believes that because the wells are within close proximity, the accuracy of the groundwater elevation contours is reduced. Flow direction had been predominantly south-southwest, but calculated flow

ATTACHMENT B

STANDARD FIELD PROCEDURES

STANDARD FIELD PROCEDURES

Weiss Associates (WA) has developed standard procedures for drilling and sampling soil borings and installing, developing and sampling ground water monitoring wells. These procedures comply with Federal, State and local regulatory guidelines. Specific procedures are summarized below.

SOIL BORING AND SAMPLING

Objectives/Supervision

Soil sampling objectives include characterizing subsurface lithology, assessing whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and collecting samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG) or a Certified Engineering Geologist (CEG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers. Split-barrel samplers lined with steam-cleaned brass or stainless steel tubes are driven through the hollow auger stem into undisturbed sediments at the bottom of the borehole using a 140 pound hammer dropped 30 inches. Soil samples can also be collected without using hollow-stem augers by progressively driving split-barrel soil samplers to depths of up to 20 ft.

Soil samples are normally collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Near the water table and at lithologic changes, the sampling interval may be less than five ft.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Analysis

After noting the lithology at each end of the sampling tubes, the tube chosen for analysis is immediately trimmed of excess soil and capped with Teflon tape and plastic end caps. The sample is labeled, stored at or below 4° C, and transported under chain-of-custody to a State-certified analytic laboratory.

Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable photoionization detector (PID) measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. PID measurements are used along with the stratigraphy and ground water depth to select soil samples for analysis.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe. If wells are completed in the borings, the well installation, development and sampling procedures summarized below are followed.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Wells are installed to monitor ground water quality and determine the ground water elevation, flow direction and gradient. Well depths and screen lengths are based on ground water depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and state and local regulatory guidelines. Well screens typically extend 15 ft below and 5 ft above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three to five ft thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two ft thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of cement with 3-5% bentonite.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security. The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

After 24 hours, the wells are developed using a combination of ground water surging and extraction. Surging agitates the ground water and dislodges fine sediments from the sand pack.

After about ten minutes of surging, ground water is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of ground water are extracted and the sediment volume in the ground water is negligible. All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Ground Water Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of ground water are purged prior to sampling. Purging continues until ground water pH, conductivity, and temperature have stabilized. Ground water samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored at 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.