December 3, 2007

Alameda County Environmental Health Services
Mr. Jerry Wickham
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

**Subject: Site Investigation Results and Workplan for Further Site Investigation and Soil Remediation**
**461 McGraw Avenue, Livermore, California 94550**
**EIS Project # 717-3E**

Dear Mr. Wickham,

On behalf of Whitney Newland, Administrator of the Estate of Crandal Mackey, Environmental Investigation Services Inc. (EIS) is submitting for your approval this site investigation report and workplan for further site investigation and soil remediation at 461 McGraw Avenue, Livermore, California. The objective of the further investigation is to delineate the extent of tetracholorethene (PCE) contamination in the shallow groundwater. This workplan also addresses remediation of shallow soil contamination found in three boring locations. The site location is shown on Figure 1.

EIS conducted a limited soil, groundwater and soil gas investigation on November 19 - 30, 2007, which involved collecting soil and groundwater samples from nine soil borings, B-7 though B-14, and installing and sampling four temporary soil-gas probes, SG-1 through SG-4 (Figure 2). The investigation was conducted in accordance with EIS's workplan dated November 2nd and 20, 2007. All of the samples were analyzed by McCampbell Analytical, Inc. (McCampbell) of Pittsburgh, California. Soil samples from each boring were screened using a photoionization detector (PID) in the field. Soil samples that exhibited indications of contamination (e.g., odor, discoloration, or elevated PID readings) were submitted for analysis of TPH as gasoline (TPHg), TPH as diesel (TPHd), TPH as oil (TPHo), benzene, toluene, ethylbenzene, total xylenes (BTEX) and volatile organic compounds (VOCs). To collect groundwater samples, temporary PVC well screen was installed in each boring to a maximum depth of 19.5 feet below ground surface (bgs); groundwater occurs at a depth of approximately 11 feet bgs. Due to very slow recharge conditions the PVC casing was sealed at the surface using bentonite and capped. EIS returned to collect groundwater samples on November 30, 2007. The groundwater samples were analyzed for TPHg, TPHd, BTEX, and VOCs. The soil gas probes (SG-1 through SG-4) were sampled using Summa canisters supplied by McCampbell and analyzed for VOCs. All the drilling work was performed by Enprob, Inc. a licensed C-57 contractor.

The analytical results for the groundwater, soil and soil gas samples are summarized in Tables 1 through 3.

Groundwater Analytical Results and Further Site Investigation Workplan

The groundwater samples collected from borings B-10, B-11, B-12 and B-14 contained PCE at concentrations of 27 micrograms per liter (µg/L), 530 µg/L, 230 µg/L, and 26 µg/L, respectively, which is above the California Department of Health Services' Maximum Contaminant Level for Drinking Water (CDHS MCL) of 5µg/L (see Table 1). EIS proposes to further delineate the extent of the PCE contamination in groundwater by installing fourteen additional soil borings (B-15 through B-28) for the purpose of collecting soil and groundwater samples. The proposed boring locations are shown in Figure 2; these may change as conditions warrant in the field. The site investigation activity will consist of advancing the fourteen soil borings to depths of approximately 19 feet below ground surface (approximately 8 feet below first encountered groundwater) to collect soil and groundwater samples. One boring (B-28) will be drilled to a maximum depth of 30 feet bgs next to boring B-11 where the highest concentration of PCE in groundwater was detected. The purpose of this deep boring is to collect a discrete-level groundwater sample from a deeper sandy unit (if encountered) to help define the vertical extent of VOC contamination.

The borings will be installed by a C-57 licensed contractor using dual-tube Geoprobe™ sampling equipment. Soil cores will be obtained from each borehole using a 4-foot long Geoprobe™ dual-tube sampler fitted with acetate liners. After each sample drive, the inner tube of the dual-tube system containing the acetate liner will be removed from the borehole, the acetate liner removed, and the sampler decontaminated by washing it using non-phosphate detergent and triple-rinsing it before fitting it with a new acetate liner. The sampler will then be inserted back into the borehole and hydraulically pushed through the next sample interval. The benefit of dual-core sampling technology is that the outer tube seals off the upper portion of the boring as the hole is advanced, which allows for discrete-interval sampling with limited slough falling in from upper levels.

While drilling the borings, soil samples will be field screened for VOCs using a PID. If evidence of solvent or hydrocarbon contamination is observed either from the PID readings or by visual observations, a sample of the potentially impacted soil will be retained and submitted for laboratory analysis. Up to two soil samples per boring from the vadose will be submitted for laboratory analysis.

One grab groundwater sample will be collected from each soil boring and analyzed for VOCs and potentially TPHg, TPHd, and TPHo if soil contamination is encountered. Temporary PVC well casing will be installed in each boring to facility groundwater sampling. It is anticipated that recharge may be slow and therefore the PVC casing will be sealed at ground surface with bentonite and then capped. EIS will return to the site to collect the groundwater samples when enough water has entered the holes. If the target sand unit is encountered in boring B-28 a groundwater sample should be collected immediately. To collect a discrete level sample from this interval, a second hole will be advanced to the depth of the sand with the end of the hollow drive rods sealed with a disposable steel tip and each joint sealed with Teflon tape. Once the target depth is reach the rods will be pulled up slightly to release the steel tip and allow water to come inside the rods. A disposable bailer will be lowered through the rods and the sample will be collected.

The soil encountered in each borehole will be logged using the Unified Soil Classification System (USCS) as a guide, and for relative moisture content, odor, and other observable characteristics. Soil encountered in the boreholes will also be monitored for the presence of VOCs using a PID.

The grab groundwater samples will be collected in EPA-approved containers provided by the analytical laboratory. The water samples will be labeled, logged onto a chain-of-custody form, and transported on ice to a California certified analytical laboratory.

The soil samples collected from the borings will be analyzed by the following methods:

- Environmental Protection Agency (EPA) Method 8015M for TPH-d and for TPH-o
- EPA Method 8260B for VOCs and TPH-g

The grab groundwater samples will be analyzed by the following methods:

- EPA Method 8260B for VOCs
- Optional groundwater analyses may include EPA Method 8015M for TPH-d and TPH-o EPA Method 8260B for TPH-g

All soil borings will be backfilled to grade with neat cement grout.

EIS will use the site-specific health and safety plan (SSP) already prepared describing potential hazards at the site (including potential contaminants and their characteristics and health effects), personnel responsible for site safety, personal protective equipment, emergency phone numbers, and the location of the nearest hospital, etc.

Soil Analytical Results and Proposed Remedial Activities

Shallow soil contamination was encountered at borings B-10, B-10A, and B-12. Soil analyses indicated concentrations of TPHd up to 3,200 milligrams per kilogram (mg/kg), TPHo up to 1,100 mg/kg and TPHg up to 38 mg/kg (see Table 2). Field screening using a PID indicated that the contamination in borings B-10 and B-12 was limited to the upper 5 feet. This was confirmed for Boring B-10 by laboratory analysis of an eight-foot deep sample (sample ID: B10@8') the result of which showed only 2.0 mg/kg for TPHd. The vertical extent of the soil contamination could not be determined at boring B-10A due to equipment limitations that prevented sampling beyond a depth of 4 feet. Boring 10A was an unplanned step-out boring drilled after encountering soil contamination at boring B-10. Since the objective of the field work at that time was not to delineate soil contamination around boring B-10, additional step out borings were not drilled.

EIS proposes to excavate the impacted soils around Borings B-10, B-10A and B-12 and take confirmation soil samples to verify that the contaminated soil in these areas was removed. EIS will use a licensed and HAZWOPER-certified contractor to excavate and remove the contaminated soil from the site. Confirmation samples will be collected from the bottom and sidewalls of the excavations and analyzed for TPHd, TPHo, TPHg, BTEX, and VOCs using EPA Methods 8015M and 8260B. A minimum of two bottom samples and four sidewall samples will be submitted from each excavation. An EIS geologist will direct the excavation activities and field screen samples with a PID. The excavated soil will be stockpiled on site atop plastic sheeting and covered with plastic sheeting until being transported off site for disposal. A four-

point composite soil sample will be collected from the soil stockpile to characterize the soil for disposal.

Soil Gas Analytical Results

Soil gas samples were collected from a depth of 5 feet bgs from SG-1 through SG-4 (Figure 2). SG-2 and 3 were installed and sampled on November 19, 2007. SG-1 and SG-4 were installed and sampled on November 21, 2007. The samples were analyzed by McCampbell using method TO-15. No VOCs were detected in the samples from SG-2 and SG-3. BTEX was detected in SG-1 and SG-4. SG-1 also contained 1,2,4- trimethylbenzene and isopropyl alcohol. Note: Isopropyl alcohol was used for leak detection which suggests that the sampling system at SG-1 was not completely sealed and did pull in some above-ground air. In addition to BTEX, SG-4 also contained PCE. Only benzene, detected in SG-4 at a concentration of 44 micrograms per cubic meter, exceeded the relevant environmental screening level (see Table 3). Additional soil gas testing may be warranted prior to any onsite construction. EIS may also propose additional soil gas investigation if the source of the PCE in groundwater can not be determined.

All activities described in this workplan will be included in the final report along with other site activities within three weeks of receipt of laboratory results. Please call Peter Littman at 408-871-1470 if you have any questions regarding this work plan.

Sincerely,

**Environmental Investigation Services, Inc**.

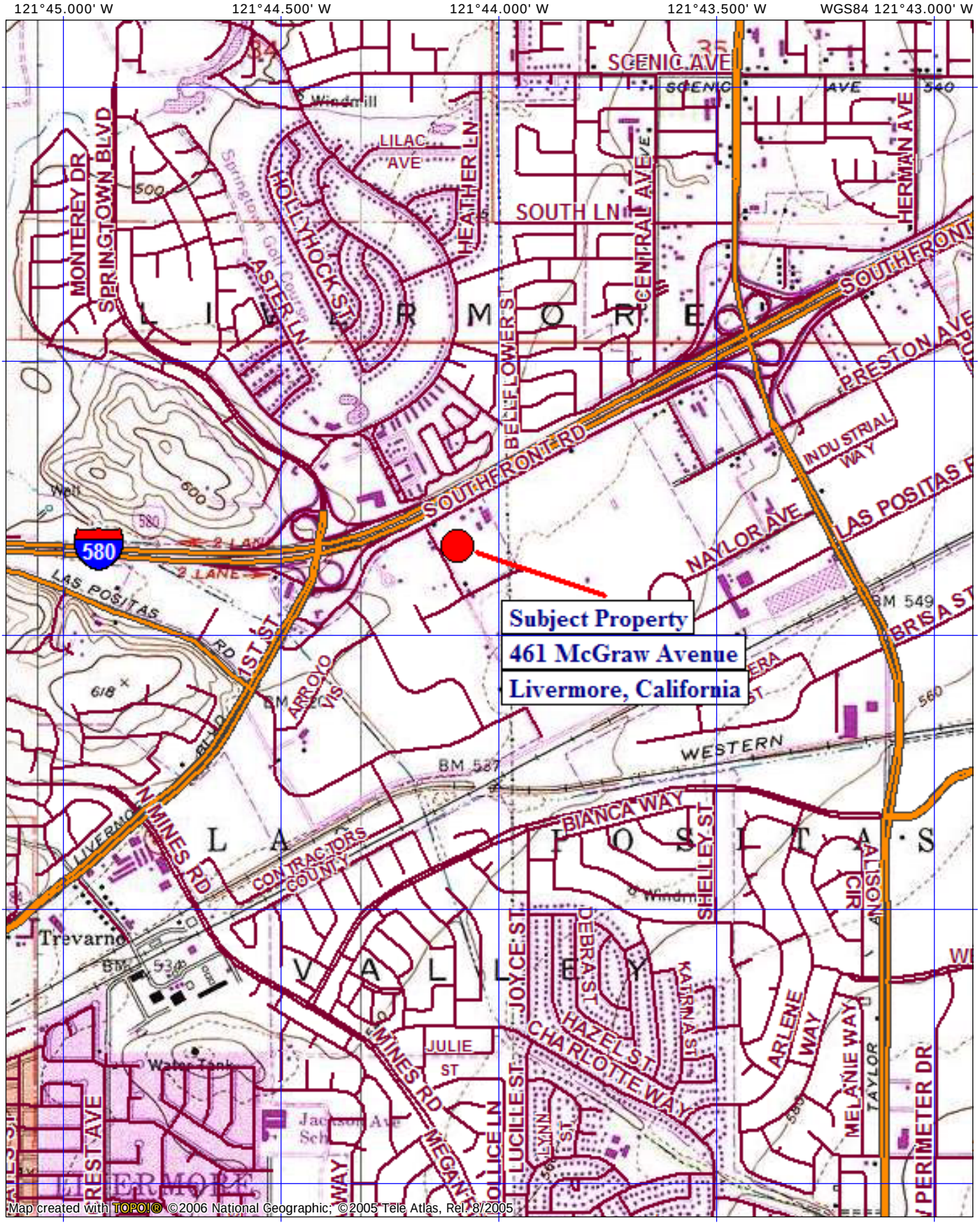
Panindhar R. Krishnamraju, Ph.D.
Hydrogeologist

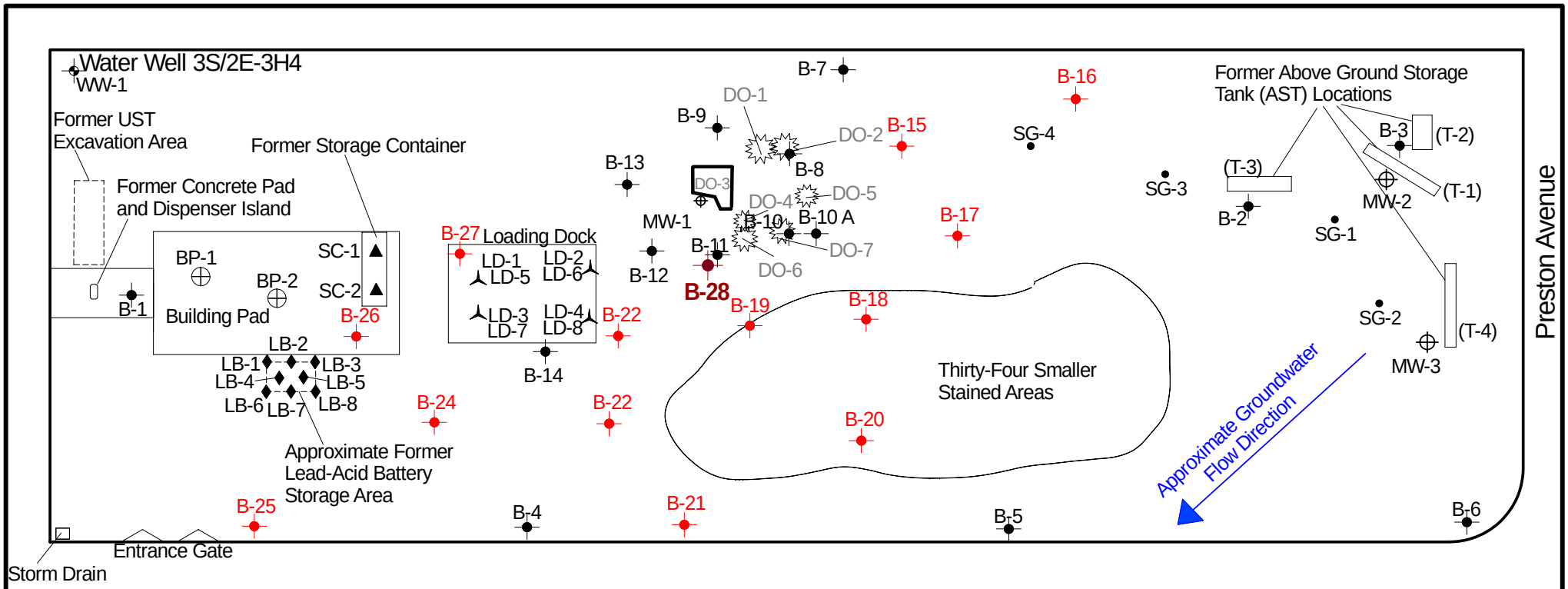
Allen Waldman, P.G. #6323
Project Geologist


Attachments:

Table 1 – Summary of Groundwater Sample Analytical Results
Table 2 – Summary of Soil Analytical Results
Table 3 – Summary of Soil Gas Analytical Results
Figure 1 – Vicinity Map
Figure 2 – Proposed Soil Boring Location Map

Figure 1 : Site Location Map



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Scale:
1" = 60'
0 60

## LEGEND

- Water Well
- WW-1 Well Water Sample
- B-4 Soil Boring
- BP-2 Building Pad Sample
- LB-1 Former Lead-Acid Battery Storage Area Sample
- DO-7 Large Petroleum Hydrocarbon-Stained Area
- LD-4 Loading Dock Sample
- SC-2 Storage Container Sample
- MW-1 Monitoring Well Location
- SG-3 Soil Gas Sample Location
- B-19 Proposed Soil Boring Location
- B-28 Proposed Deeper Soil Boring Location

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Figure 2 Proposed Soil Boring Location Map
461 McGraw Avenue
Livermore, California

Table 1 -- Summary of Groundwater Sample Analytical Results
Method 8015M for TPH-d  Method 8260B for VOCs, TPH-g, and Fuel Oxygenates
461 McGraw Avenue, Livermore, California

| Boring | Date | TPH-g | TPH-d | MTBE | Benzene | Toluene | Ethylbenzene | Xylenes | Tetrachloroethene | Chloroform | Trichlorofluoromethane | Other VOCs | Other Oxygenates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-7 | 11/30/2007 | <50 | <50 | <5.0 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | ND | ND |
| B-8 | 11/30/2007 | <50 | <50 | <5.0 | <0.5 | 0.55 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | ND | ND |
| B-9 | 11/30/2007 | <50 | <50 | <5.0 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | ND | ND |
| B-10 | 11/30/2007 | <50 | 84,b | <5.0 | <0.5 | <0.5 | <0.5 | <0.5 | **27** | 1.1 | <0.5 | <0.5 | ND |
| B-11 | 11/30/2007 | <50 | <50 | <5.0 | <0.5 | <0.5 | <0.5 | <0.5 | **530** | <0.5 | <0.5 | ND | ND |
| B-12 | 11/30/2007 | 120,f | 54,b | <5.0 | <0.5 | <0.5 | <0.5 | <0.5 | **230** | <5.0 | <5.0 | ND | ND |
| B-13 | 11/30/2007 | <50 | <50 | <5.0 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 0.77 | ND | ND |
| B-14 | 11/30/2007 | <50 | <50 | <5.0 | <0.5 | <0.5 | <0.5 | <0.5 | **26** | <0.5 | <0.5 | ND | ND |
| CDHS MCL | | -- | -- | 5[(a)] | 1 | 150 | 300 | 1,750 | 5 | -- | -- | -- | -- |
| Drinking Water ESLs | | 210 | -- | 13 | 1.0 | 150 | 700 | 1,800 | 500 | -- | -- | -- | -- |

Notes:
Data are reported in micrograms per liter (μg/L)
TPH-g = Total Petroleum Hydrocarbons as gasoline
TPH-d = Total Petroleum Hydrocarbons as diesel
VOCs = Volatile Organic Compounds
MTBE = Methyl tert-Butyl Ether

(a) = This is the secondary MCL for MTBE, which is based on qualitative factors such as taste and odor.  The primary MCL for MTBE, the value that has been determined to be protective of human health, is 13 micrograms per liter.
(b) = diesel range compounds are significant; no recognizable pattern;
(f) = one to a few isolated non-target peaks present;
-- Not Established
Drinking Water ESLs = Regional Water Quality Control Board's Environmental Screening Levels for drinking water.
CDHS MCL = California Department of Health Services' Maximum Contaminant Level for Drinking Water

ND = Not Detected
-- = Not Established

Table 2 -- Summary of Soil Analytical Results
Method 8015B for TPH-d and TPH-o; Method 8260B for TPH-g, VOCs, and Fuel Oxygenates
461 McGraw Avenue, Livermore, California

| Soil Sample | Depth (feet) | Date | TPH-d | TPH-o | TPH-g | MTBE | Benzene | Toluene | Ethylbenzene | Total Xylenes | Other VOCs | Other Oxygenates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B10 @ 3.5' | 3.5 | 11/21/2007 | **1600,a/m** | 520 | 38 | <0.050 | <0.050 | <0.050 | 0.069 | 0.47 | ND | ND |
| B10 @ 8' | 8 | 11/21/2007 | 2.0,b | <5.0 | <0.25 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | ND | ND |
| B10A @ 3.5' | 3.5 | 11/21/2007 | **3100,a/m** | **1100** | 4.6 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | ND | ND |
| B12 @ 2' | 2 | 11/21/2007 | **3200,a/m** | 880 | <2.5 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | ND | ND |
| RWQCB ESL | | | 100 | 1,000 | 100 | 0.023 | 0.044 | 2.9 | 3.3 | 2.3 | -- | -- |
| USEPA PRG | | | -- | -- | -- | 70 | 1.4 | 520 | 400 | 420 | -- | -- |

Notes:

Data are reported in milligrams per kilogram (mg/kg).
TPH-g = Total Petroleum Hydrocarbons as gasoline
TPH-d = Total Petroleum Hydrocarbons as diesel
TPH-o = Total Petroleum Hydrocarbons as oil
ND = Not Detected

VOCs = Volatile Organic Compounds
MTBE = Methyl tert-Butyl Ether
-- = Not Established

RWQCB ESL = Regional Water Quality Control Board's Shallow Soil Environmental Screening Level for Commercial or Industrial Property where groundwater is currently or potentially a drinking water resource.

USEPA PRG = United States Environmental Protection Agency's Preliminary Remediation Goal for Industrial Soil.
a = unmodified or weakly modified diesel is significant
b = diesel range compounds are significant; no recognizable pattern
m = fuel oil

Table 3 : Summary of Soil Gas Analytical Results
Method TO15
461 MacGraw Avenue, Livermore, California

| Sample | Date | Benzene | Isopropyl Alcohol | 1.2-Dibromo-3-chloropropane | Ethylbenzene | 1,2,4-Trimethylbenzene | Tetrachloroethene | Toluene | Xylenes | Other VOC's |
|---|---|---|---|---|---|---|---|---|---|---|
| SG-1 | 11/21/2007 | 28 | 120 | <20,k | 49 | 20 | <14 | 250 | 190 | ND |
| SG-2 | 11/19/2007 | <6.5 | <25 | <20,k | <8.8 | <10 | <14 | <7.7 | <27 | ND |
| SG-3 | 11/19/2007 | <6.5 | <25 | <20,k | <8.8 | <10 | <14 | <7.7 | <27 | ND |
| SG-4 | 11/21/2007 | 44 | <25 | <20,k | 21 | <10 | 60 | 150 | 78 | ND |
| CHHSL Shallow Soil Gas Screening Levels: | | 36.2 | -- | -- | -- | -- | 180 | 135,000 | 315,000 | -- |

Notes:

Data and CHHSL Shallow Soil Gas Screening Levels are reported in micrograms per liter ($\mu g/m^3$)

CHHSL Soil Gas Screening Levels are based on soil gas data collected less than 1.5 meters (5 feet) below a building foundation or the ground surface. Intended for evaluation of potential indoor-air impacts for **Residential Land Use**.

k = this compound's reporting limit does not meet the ESL for residential soil gas;

-- Not Established