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Alameda County  
Environmental Health



February 25, 2008

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

**Subject: Remedial Excavation Workplan  
461 McGraw Avenue, Livermore, California 94550  
EIS Project # 717-4**

Dear Mr. Wickham,

On behalf of Whitney Newland, Administrator of the Estate of the late Crandal Mackey, and Probate Court-authorized agent for Call Mac Transportation Company, Environmental Investigation Services Inc. (EIS) is submitting this workplan for Remedial Excavation of the PCE contaminated groundwater and soil gas at 461 McGraw Avenue, Livermore, California (the site) for your approval. This revised workplan addresses the Alameda County Environmental Health Services (ACEH) letter dated January 24, 2008.

This workplan details the procedures for excavating and disposing of PCE-contaminated soil, confirmation soil sampling, sample handling, sample analyses, pumping and treating PCE contaminated groundwater and discharging to the sanitary sewer. This workplan also details the procedures for screening, sampling of vadose zone excavated soils for possible reuse as fill material.

The site is located northeast of the intersection of McGraw Avenue and Preston Road in Livermore, Alameda County, California. The nearest surface water is Arroyo Seco, located approximately ½ mile south of the site. Surface water in Arroyo Seco flows to the northwest. The site location is shown on Figure 1. Figure 2 depicts the site plan, including various features of concern. The site is currently vacant, but was formerly used by Call Mac Transportation Company as truck and trailer storage yard.

## **BACKGROUND**

The site background has been discussed extensively in previous reports, so only background related to PCE groundwater characterization will be discussed.

On August 30, 2007, EIS submitted *Site Investigation and Remedial Action Workplan* to address ACEH's request for additional work.

ACEH's September 7, 2007, letter was issued in response to EIS' Site *Investigation and Remedial Action Workplan*. In this letter ACEH requested a historic review of the property, a well survey, and a workplan for a soil gas survey. The ACEH concurred with the proposed excavation and disposal of arsenic-impacted soil from the building pad, excavation and disposal of soil from excavation DO3, reuse plan of loading dock soil, decommissioning of water supply well in excavation T-4, and the plan to install and sample three groundwater monitoring wells as presented in the August 30, 2007 Workplan.

EIS conducted the historical review of the property and prepared a report describing the research sources and findings dated October 31, 2007. Based on the historic review of the property a EIS prepared *Soil Gas Survey Workplan* dated November 2, 2007.

ACEH's November 8, 2007, letter was issued in response to this *Soil Gas Survey Workplan*. In this letter ACEH accepted the Soil Gas Survey workplan, with slight modifications to boring locations. The ACEH letter requested two of the soil gas borings be placed in approximate locations of former waste oil and polymer resin drums. The ACEH letter concluded with a request for submittal of the Site Investigation and Remedial Action Report by January 29, 2008. On January 14, 2008, EIS submitted *Further Site Investigation and Remedial Action Report*, which is the first of two reports to be submitted by EIS in January 2008 to present investigation results.

On November 5, 2007 monitoring wells MW-1 through MW-3 were installed at the locations shown on Figure 2. The monitoring well will be used to verify the success of recent remedial action on improving groundwater quality, groundwater flow direction, and groundwater flow gradient in the vicinity of the site. The groundwater sample collected from monitoring well MW-1 contained 10 micrograms per liter ( $\mu\text{g/L}$ ) of tetrachloroethene (PCE). No TPH-g, TPH-d, BTEX compounds, or other VOCs were detected in the November 9, 2007 groundwater samples collected from monitoring wells MW-1, MW-2 and MW-3. The California Department of Health Services (DHS) maximum contaminant level (MCL) for PCE in drinking water is 5  $\mu\text{g/L}$ . The monitoring wells were resampled on November 27, 2007, and results of the analysis revealed concentrations of PCE at 7.3  $\mu\text{g/L}$  at MW-1.

Thirty-six temporary soil borings and twenty-four soil gas points were installed in an effort to characterize the PCE groundwater plume and determine the source. The results of the PCE groundwater characterization were presented in the EIS, Inc. January 18, 2008 report. PCE was detected in 22 of the 24 soil gas probe at concentrations ranging between 45 micrograms per cubic meter ( $\mu\text{g/m}^3$ ) to 40,000  $\mu\text{g/m}^3$ . Samples from eight probes exceeded the California Human Health Screening Level (CHHSL) for PCE in soil gas (Table 1). Soil screening conducted in the field along with soil sample analyses from the locations where elevated soil gas concentrations were detected has not revealed elevated concentrations of VOCs strongly suggestive of a source for the PCE contamination. To this point the area or areas where the PCE entered the ground has not been identified.

The results of the 36 temporary soil borings showed that the majority of the PCE groundwater plume was confined to within the property boundary. It is possible that some low concentrations of PCE extent beyond the property boundary to the west beneath McGraw Avenue. The highest concentration of PCE detected was 1,800  $\mu\text{g/L}$  at boring B-30A from a depth of 15 feet bgs. The

investigation showed that the concentration of PCE attenuates with depth. The vertical extent of PCE on the east side of the plume was defined to a depth of approximately 28 feet bgs. Additional work would be performed to delineate the vertical extent of PCE on the western side of the plume near boring B-26.

To determine the vertical extent of PCE contamination in soil and groundwater near boring B-26, EIS installed one 36-foot deep continuously-cored pilot boring (B-37) and four discrete-level groundwater sampling probes to 28, 33, 38, and 45 feet bgs on January 25, 2008. Soil samples collected from 15.5 feet and 19.5 feet bgs from boring B-37 contained low concentrations of PCE which are below RWQCB ESL and EPA PRG for residential properties (Table 2). Low PCE concentrations were detected from grab groundwater B-26@28 and B26@38 at 1.2 µg/L and 0.68 µg/L respectively, no PCE was detected in the samples from 33 and 45 feet bgs (Table 2). The vertical extent of PCE in groundwater above the maximum contaminant level (MCL) of 5 µg/L on the western side of the plume appears to be approximately 28 feet bgs.

The investigation also showed that site is underlain mostly by low permeable, fine-grained soil (i.e., silts and clays) with no significant sand units present to the maximum depth explored of 36 feet.

Now that the groundwater plume has been defined both horizontally and vertically, the object of this workplan is to provide a cost effective method the significantly reduce the overall mass of PCE in the groundwater and remove areas of elevated PCE in soil gas. This proposed remedial action presented below is not intended to completely remove the PCE contamination in groundwater or soil gas, a tentative target cleanup level of 50 µg/L of PCE in groundwater has been suggested by ACEH as a desirable goal.

## **REMEDIAL EXCAVATION WORKPLAN**

The goal of the proposed remedial action includes excavating PCE impacted soil, pumping and treating of contaminated groundwater to the extent practical so to reach the San Francisco RWQCB target goal of 5 µg/L for PCE in groundwater. Because the site is currently vacant and undeveloped, and the lateral extent appears to be limited to within the site boundary, the proposed remedial methods will be the quickest and most cost-effective methods for reducing chlorinated hydrocarbon mass at the site.

Remedial action proposed for the subject site will consist of the following tasks:

- ◆ Remove shallow soil containing elevated PCE in soil gas by excavating two areas to a depth of approximately 10 feet bgs. The first area will be approximately 58 feet by 26 feet in size the other will be approximately 63 feet by 25 feet in size.
- ◆ Stockpile the vadose zone excavated soils and collect composite soil samples to characterize for possible reuse as fill material.
- ◆ Collect confirmation soil samples from the excavation sidewalls and bottom.
- ◆ Create a triangular-shaped groundwater capture zone by digging approximately 5 feet wide by 20 feet deep intersecting trenches in the most highly contaminated groundwater zone.

- ◆ Pump and treat groundwater from the extraction trenches. The extracted water will be temporarily stored in one or more 20,000 gallon temporary above ground storage tanks on site.
- ◆ Treatment of PCE contaminated storage water using carbon vessels pending permitted disposal to sanitary sewer.
- ◆ Monitor the effect of the groundwater extraction by installing and gauging new groundwater monitoring wells.
- ◆ Transfer all soil and groundwater samples, under chain of custody documentation, to a state-certified laboratory for analysis of VOCs.
- ◆ Load, transport, and dispose of PCE-impacted soil at an off-site facility.
- ◆ Prepare a report of the remedial action documenting field activities, laboratory analyses, soil disposal, and excavation backfill.

These tasks are further detailed below.

### **Shallow Soil Excavation**

Macoy Resources Corp. (MRC) will perform the excavation portion of the project. Prior to soil excavation, the work area will be delineated with white marking paint, and Underground Service Alert will be contacted for utility line location and marking. All site work will be performed in accordance with a site-specific health and safety plan (Attachment A).

Shallow soil will be excavated in two areas between B-11 and B-26 where the highest concentrations of PCE in soil gas and groundwater were detected (Figure 3 & 4). The size of the shallow excavations will be approximately 58 feet by 26 feet and 63 feet by 25 feet and both will be dug to a depth of approximately 10 feet bgs, approximately 1 foot above the top of the shallow saturated zone. The two proposed excavation areas are shown on Figure 4. The dimensions of these excavations may vary depending on the field conditions. Excavated soil will be placed on plastic and will be covered with plastic to help control the release of VOC vapors and to protect the soil stockpile from inclement weather.

### **Excavation and Stockpile Soil Sampling for Reuse**

After all or part of the soil excavation is completed, excavation sidewall and bottom soil samples will be collected. EIS anticipates collecting a minimum of twelve excavation sidewall and six excavation bottom samples. Additional soil samples may be collected, if requested by ACEH.

The vadose zone excavation soil stockpile will be sampled to characterize the soil for possible reuse as fill material. Soil stockpiles of approximately 100 cubic yards will be created as the excavation progresses. Stockpile soil samples will consist of 4:1 composite samples. The frequency of soil stockpile sample collection (e.g., 1 sample for every 100 cubic yards) will be designed to comply with reuse soil characterization requirements.

## **Laboratory Analyses**

Excavation and stockpile soil samples will be submitted to McCampbell Analytical, of Pittsburgh, California for analysis. McCampbell Analytical is California certified for hazardous waste analyses. All of the confirmation and stockpile soil samples will be analyzed for VOCs using modified EPA Method 8260.

## **Soil Disposal**

Reuse and/or disposal of soil from excavations will be determined based on results analysis of composite soil samples. Any soil requiring offsite disposal, will be coordinated by MRC. Copies of non-hazardous waste manifests and soil weight tickets will be retained by EIS to document soil disposal.

## **Monitoring Well Installation**

Before initiating the groundwater extraction program, static groundwater conditions will be ascertained by installing three groundwater monitoring wells. Monitoring wells MW-4 through MW-6 will be installed at the locations shown on Figures 2 through 4. The monitoring wells will be used to characterize groundwater quality, groundwater flow direction, and groundwater flow gradient in the vicinity of the PCE groundwater plume prior to, during, and after the groundwater extraction program has been completed. Prior to installing the proposed monitoring wells, EIS will submit well permit applications to the Zone 7 Water District.

The proposed new monitoring wells will be drilled using 8-inch diameter hollow-stem auger drilling equipment. During drilling, soil samples will be collected continuously using a split-spoon sampler or 5-foot continuous sampler. Soil samples recovered from the boreholes will be used to prepare boring/well logs.

The exploratory borings will be advanced through near-surface unsaturated materials, into the shallowest aquifer, extending to a total anticipated depth of 20 feet. The borings will be converted to monitoring wells by installing 2-inch diameter Schedule 40 PVC well casing and factory-slotted well screen with 0.010-inch slots. EIS anticipates placing well screen from 10 to 20 feet below ground surface; however, the actual screened interval will be based on conditions encountered in the field. A graded sand pack will be placed in the annular space adjacent to the well screen, extending at least 2 foot above the top of the screened interval, followed by a 2-foot (minimum) interval of hydrated bentonite and a neat cement seal extending to within 1 foot of the ground surface. A locking cap and traffic-rated vault box or steel surface monument will be installed to secure the wells.

All drill cuttings, purge water, and equipment decontamination rinsate water will be stored on site in sealed drums pending analysis and disposal. Upon completion of all other field activities, EIS will arrange for composite sampling, analysis, and disposal of drill cuttings from all borings, and purge water from the monitoring wells.

## **Well Development**

Following well construction, the wells will be developed using surging and bailing techniques. Water column volumes will be calculated to determine the minimum volume of water to remove from each well. During purging, data will be collected on groundwater depth, pH, temperature, and specific conductivity. The wells will be purged until the minimum calculated water volume had been removed and until water quality parameters had stabilized. The stabilization criteria were at least three (3) consecutive readings within a 10% range for all parameters. Once purging is completed, final depth –to-water and total depth measurements will be taken before closing the well.

### **Well Survey**

A California licensed surveyor will survey the relative positions and casing elevations of the wells using the US State Plane 1983 coordinate system and NAD 1983 datum.

### **Groundwater Sampling and Water Level Measurements**

After installation and development, EIS will measure water levels in all of the on-site monitoring wells to determine natural groundwater flow direction and to ascertain initial conditions before initiating the groundwater extraction program. Depths to groundwater and total monitoring well depths will be measured using the surveyed top of well casing (TOC) as a reference point.

The three new monitoring wells, MW-4 through MW-6 will be sampled before initiating the groundwater extraction program. Prior to groundwater sampling the monitoring wells will be purged of a minimum of three casing volumes using new single-use disposable bailers. During purging, pH, electrical conductivity (EC), and temperature will be monitored to ensure that a representative sample is obtained. Following purging, groundwater samples will be collected and sealed within EPA-approved containers provided by the analytical laboratory. The groundwater samples will be labeled, logged onto a chain-of-custody form, and transported on ice to the analytical laboratory.

### **Laboratory Analyses**

The groundwater samples will be submitted to McCampbell Analytical, of Pittsburgh, California for analysis VOCs using EPA Method 8260B. McCampbell Analytical is California certified for hazardous waste analysis.

### **Groundwater Extraction Program**

To extract PCE contaminated groundwater from the areas identified as having the highest concentrations of PCE, EIS proposes to dig three intersecting trenches (named A, B and C) roughly 20 to 22 feet deep (approximately 10 feet below the top of the saturated zone) in a triangular configuration as shown in Figure 3. The excavation details are described below. A pumping system will be designed that will attempt to keep the trenches dewatered enough so that water from the surrounding area will flow into them, thereby creating a localized area of hydraulic depression. The new wells will be measured periodically in an effort to determine the zone of influence from the trench dewatering. Conditions on water treatment and disposal, which are still pending with the

City of Livermore, could hamper this effort. The alternative would be to intermittently dewater the trenches, which would still accomplish the goal of removing PCE mass from the subsurface.

Trench A will be excavated approximately 4 feet wide by 120 feet long and 22 feet deep in the east-west direction. Trench B will be excavated approximately 4 feet wide by 90 feet long and 22 feet deep in the northeast-southwest direction. Trench C will be excavated approximately 4 feet wide by 60 feet long and 22 feet deep in the northwest-southeast direction. The proposed trenches are shown on Figure 3.

To establish initial conditions, a grab groundwater sample from the extraction trenches will be collected at the start of the program and analyzed for VOCs by EPA Method 8260B. Additional grab groundwater samples will be collected as the program progresses to evaluate the effectiveness of the remedial effort. EIS will be reporting the groundwater analytical results to the ACHD during the program so that a joint decision can be made as to whether an appropriate level of clean up has been reached. During these status reports EIS will also provide recent water level data collected from the new wells.

Groundwater extracted from the trenches will be stored temporarily in 20,000-gallon above-ground storage tanks on site or discharged directly to the sanitary sewer depending what the City of Livermore requires. It is estimated that an approximately 67,000 gallons of PCE contaminated groundwater will be extracted from the trenches; this is based on the estimated dimensions of the trenches and the volume of water they would contain if water levels were to recharge to a static water level of approximately 10 feet bgs. The total volume to be extracted could be significantly more depending on the rate of recharge into the trenches. EIS will apply for a wastewater discharge permit with City of Livermore and comply with its provisions to discharge water to sanitary sewer. If necessary the stored groundwater will be treated using carbon vessels prior to disposal.

### **Stockpile Disposal**

Unsaturated soil will be stockpiled separately from the saturated soils as the trenches are excavated. The unsaturated soils will be evaluated for potential reuse and will be sampled using a 4:1 composite for each volume of 100 cubic yards. The saturated zone excavation soils from trenches will be sampled to characterize the soil for off-site disposal. Stockpile soil samples will consist of 4:1 composite samples. The frequency of soil stockpile sample collection (e.g., 1 sample for every 250 cubic yards) will be designed to comply with disposal site characterization requirements. Analyses will include VOCs by EPA method 8260B as well as any other analyses required by the receiving landfill. Soil disposal will be coordinated by MRC. Copies of non-hazardous waste manifests and soil weight tickets will be retained by EIS to document soil disposal.

### **Excavation Backfill**

After achieving the remedial action goal - removing, to the extent practical, site soil containing VOCs in excess of applicable ESLs - the excavation will be backfilled with clean imported fill material and any material that tested clean.

### **Limitations to the Proposed Groundwater Remediation Program**

The objective of the proposed groundwater remediation program is not to clean up the groundwater beneath the subject property to less than the MCL for PCE. The primary goal of the program is to remove a significant volume of PCE impacted groundwater from the area where the PCE contaminations is the highest. Comparing initial and final PCE concentrations from water extracted from the trenches will determine the level of success in meeting this goal. Success criteria would be a significant reduction in PCE concentrations between the initial and the final grab groundwater samples from the trenches.

### **REPORT**

EIS will prepare a report documenting the soil and groundwater remedial action program. The report will include the following:

- a description of all work performed including the soil excavation work, the well installation and sampling, and trenching and grab groundwater sampling methods,
- total volume of groundwater extracted,
- total volume of soil excavated along with volume of soil removed from the site versus the volume reused as fill,
- analytical results of groundwater grab samples from the trenches and from the monitoring wells,
- analytical results from soil samples from the shallow excavations and composite samples,
- copies of relevant permits including the groundwater discharge permit and well installation permit,
- a site map showing the excavated area and sampling locations,
- laboratory analytical reports,
- and soil and groundwater disposal documentation,
- boring logs, well development logs and well sampling logs,

### **SCHEDULE**

EIS will begin implementing the workplan within one working day of approval by ACEH, weather permitting. We anticipate the field portion of this workplan to require one to two months. The technical report will be prepared and submitted within three weeks of completion of field activities.

Please contact Peter Littman of EIS at (408) 871-1470 if you have any questions regarding the proposed workplan and schedule.

Sincerely,

**Environmental Investigation Services, Inc.**



*U. Panindhar*

Panindhar R. Krishnamraju, Ph.D.  
Hydrogeologist



Allen J. Waldman, PG#6323  
Project Geologist

Attachments:

Table 1- Summary of Soil Sample Analytical Results

Table 2 – Summary of Grab Groundwater Sample Analytical Results

Table 3 – Summary of Soil Gas Sample Analytical Results

Figure 1 – General Site Location Map

Figure 2 – Site Plan with Proposed Excavations, Monitoring Wells and Borings

Figure 3 – Excavation Trenches with PCE Concentrations in Groundwater

Figure 4 – Excavation Pits with PCE Concentrations in Soil Gas

Attachment A – Site Health and Safety Plan

**ATTACHMENT A**  
**SITE HEALTH AND SAFETY PLAN**

## SITE HEALTH & SAFETY PLAN

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**SITE HEALTH & SAFETY PLAN**  
**ENVIRONMENTAL INVESTIGATION SERVICES, INC.**

**PROJECT NAME:** Call Mac Transportation Company  
**LOCATION:** 461 McGraw Avenue, Livermore, CA.  
**DATE:** 5/18/07  
**TASK:** Site Investigation and Remedial Action

**PROJECT MANAGER:** Peter Littman  
**PROJECT SAFETY OFFICER:** Jennifer Morris  
**SITE SAFETY OFFICER (SSO):** Jennifer Morris

**NEAREST HOSPITAL:** Valley Care Medical Center  
Phone: 911  
Address: 5555 Las Positas Blvd, Pleasanton, CA

**NEAREST FIRE DEPARTMENT:** Livermore-Pleasanton Fire Department  
3560 Nevada Street, Pleasanton, 94566  
Phone: 911 or (925) 454-2361

**HAZARDOUS MATERIALS SPILL/  
CLEAN-UP CONTRACTOR:** MACOY Resource Corp.  
Phone: (805) 227-1090 Cell (805) 391-3013  
Address: P.O. Box 3980  
Paso Robles, California 93447

**U. S. ALERT SERVICE NUMBER:** (800) 642-2444

**NEAREST PG&E OFFICE:** Livermore, CA  
24-hr Emergency Phone: (800) 743-5000  
Address: Livermore, California

**NEAREST TELEPHONE LOCATION:** Macoy Resources Cell and EIS Cell Phone

**LOCATION OF SITE "CLEAN AREA":** as per SSO: See Map.

**LOCATION OF PERSONNEL DECON: STATION:** as per SSO: See Map.

The following pages contain guidelines for on-site procedures to minimize risks to personnel at the job site, as well as information regarding basic first aid in the event of injury, among other points.

A pre-project Safety Meeting to familiarize all field personnel the potential hazards associated with the job shall be held at the start of each day's activities. Pre-project Safety Meeting held by:

X \_\_\_\_\_ Date: \_\_\_\_\_

X \_\_\_\_\_ Date: \_\_\_\_\_

X \_\_\_\_\_ Date: \_\_\_\_\_

X \_\_\_\_\_ Date: \_\_\_\_\_

We, the undersigned, have read the Site Safety Plan and understand the potential hazards on-site. We will follow the guidelines set forth in order to decrease the likelihood of personal or public injury.

X \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_  
\_\_\_\_\_

X \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_  
\_\_\_\_\_

X \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_  
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X \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_  
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SITE HEALTH & SAFETY PLAN  
ENVIRONMENTAL INVESTIGATION SERVICES, INC.

I. HEALTH AND SAFETY PROGRAM OVERVIEW

- A. In order to promote health and safety awareness, the position of Site Safety Officer (SSO) is rotated among employees for each project site.
- B. It is the responsibility of the designated SSO to implement the Site Safety Plan (SSP) and to hold a pre-project safety meeting.

II. FACILITY BACKGROUND

A. Site History

The site is located northeast of the intersection of McGraw Avenue and Preston Road in Livermore, Alameda County, California. The nearest surface water is Arroyo Seco, located approximately ½ mile south of the site and flow to the northwest. The site location is shown on Figure 1. The attached Figure depicts the site layout and features of concern. The site is currently vacant, but was formerly used by Call Mac Transportation as a truck storage and salvage yard. A site plan is shown in Figure 2.

According to Applied Remedial Technologies' (ART's) *Proposed Work Plan to Conduct Soil Removal and Confirmation Sampling of the Impacted Soils at the Former Diesel UST Dispenser Island, Below the Former Above Ground Storage Tanks, and at the Recent Diesel Spill Areas, 461 McGraw Avenue, Livermore, California, 94550*, issued to Alameda County Environmental Health Services (ACEH) April 2, 2007, an underground storage tank (UST) was removed from the site in 1995. A visual inspection of the UST after it had been removed revealed that it was generally in good condition, with no visible holes. No hydrocarbon odor or staining was reported in the former UST pit, and the three soil samples collected from the tank pit contained no detectable petroleum hydrocarbons. Both the field observations and the soil sample analytical results (soil samples S-1 through S-3) reported that no petroleum hydrocarbons were detected. In addition, one water sample was collected from the excavation from approximately 13 to 14 feet below ground surface (bgs). There were no detectable concentrations of any of the constituents analyzed.

One soil sample was collected below the dispenser island (S-4), and was found to contain 17,000 milligrams per kilograms (mg/kg) total petroleum hydrocarbons as diesel (TPH-d). This sample was collected from an area of obvious over-spillage. No benzene, toluene, ethylbenzene or xylenes (collectively BTEX) was detected.

According to information gathered during the development of this workplan, there are three ASTs (T-1 through T-3) located at the site. AST (T-1) appears to have been moved from another location (T-4) on the site. ART submitted *Work Plan to Remove the Three Remaining Storage Tanks, 461 McGraw Avenue, Livermore, California 94550* to the Livermore-Pleasanton Fire Department (LPFD) on April 2, 2007 outlining procedures for decommissioning and disposing of the ASTs and their contents, and for sampling the soil beneath the ASTs. According to the workplan ART submitted to ACEH, the Department of Toxic Substances Control (DTSC) has conducted soil sampling activities below two of the

existing ASTs. The soil analytical data show that the ASTs have impacted the soil below them, and excavation will be necessary in the area.

There are also a total of 34 small areas where petroleum hydrocarbon staining has been noted. There are also 7 larger areas of petroleum hydrocarbon staining that were the results of unauthorized releases during Golden State Metal's crushing of vehicles at the site.

On July 26, 2007, EIS issued *Soil Removal and Site Investigation Report, 461 McGraw Avenue, Livermore, California 94550*, which described excavation activities, sampling activities, and well repair activities at the site.

ACEH issued a letter in response to this report on August 3, 2007. In their letter, ACEH states that no additional investigation or soil removal for several locations, including the vicinity of the former pump island and underground storage tank (UST), the former lead-acid battery storage area, the surface stains attributed to Golden State Metals, Inc. (except for Area DO3, see Figure 2), three of the former aboveground storage tank areas (AST Areas T-1, T-2, and T-3, see Figure 2), and the water supply well in the northeast corner of the site.

The August 3, 2007, letter also included requests for additional work. ACEH requested remediation of the arsenic-impacted material of the building pad, explanation of the future use and/or disposal of the loading dock, additional excavation in area DO3, proper abandonment of the well in excavation T-4, a historical review for the site, the installation and sampling of three monitoring wells, and a soil gas survey. The proposed work for this site addresses all of ACEH's comments except the request for a soil gas survey, which will be planned at a later date.

B. Chemical Constituents of Concern. The following chemicals are likely to be present on site: benzene, toluene, ethylbenzene, and xylenes (BTEX)

#### C. Scope of Work

The Site Remediation and Investigation Activities will consist of the following tasks:

- ◆ Conduct an historical review of the property and prepare a report describing research sources and findings.
- ◆ Excavate and dispose of approximately 300 tons of arsenic-impacted soil from the building pad (Figure 3). Collect ten confirmation soil samples from the base of the excavation to be analyzed for arsenic using United States Environmental Protection Agency (EPA) Method 6010B.
- ◆ Excavate and dispose of approximately 90 tons of soil from Excavation DO3. Collect four confirmation soil samples from the base of the excavation and two confirmation soil samples from the sidewalls of the excavation. All samples will be analyzed for total petroleum hydrocarbons as gasoline (TPH-g), as diesel (TPH-d), and as oil (TPH-o) using EPA Method 8015B, and for methyl tert-butyl ether (MTBE), and benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B.

- ◆ Collect one four-point composite soil sample for waste profiling of the stockpiled soil and debris removed from Excavation E4. The sample will be analyzed for Title 22 Metals using EPA Method 6010B, TPH-o and TPH-d using EPA Method 8015M, and volatile organic compounds (VOCs) using EPA Method 8260B.
- ◆ Dispose of the soil and debris stockpile from Excavation E4, and dispose of portions of the loading dock where debris is intermixed with the soil. Any loading dock soil observed to be free of debris will be used to backfill open excavations onsite.
- ◆ Install and develop three monitoring wells: one near Excavation T-4, one near boring B-3, and one near Excavation DO3. Have the wells located by a professional land surveyor. Conduct two groundwater sampling events with a four-week interval between the events. Groundwater samples will be analyzed for TPH-g, TPH-d, and TPH-o using Method 8015B; for MTBE and BTEX using Method 8021B; and for Title 22 Metals using Method 6010B.
- ◆ Determine the total depth of the well in Excavation T-4, and decommission it according to Zone 7 Water District.
- ◆ Prepare a report describing all site activities, field methods, field observations, laboratory analyses, analytical results, conclusions, and recommendations.

### III. SITE CHARACTERIZATION / JOB HAZARD ANALYSIS

#### A. Physical Hazards

1. Operation of Heavy Equipment
  - a. Backhoe or Excavator
  - b. Geoprobe Truck
  
2. Electrical Shock
  - a. Overhead Wires 10 feet clearance
  - b. Faulty electric wiring on equipment
  - c. Faulty electric service to equipment
  
3. High Traffic Areas
  - a. Traffic barricades for work areas and traffic control if necessary
  
4. Drilling
  - a. Encountering underground utilities
  
5. Hearing Loss
  - a. Engine-driven equipment
  - b. Impact tools
  
6. Hazardous Chemical Exposure:
  - a. Soils and/or soil gas vapors may contain an assortment of residual BTEX. Chemicals are moderately toxic and highly flammable, causing explosive concentrations in air over a range of 0.8% to 6% by volume.
  
7. Chemical List: Residual gasoline is present onsite. Consult NIOSH Pocket Guide to Chemical Hazards for other information.



- a. Benzene
  - (1) Routes of entry
    - (a) Inhalation
    - (b) Ingestion
    - (c) Dermal contact
    - (d) Absorption
  - (2) Acute Symptoms
    - (a) Fatigue
    - (b) Eye, nose and skin irritation
    - (c) Giddiness
    - (d) Headache
    - (e) Nausea
    - (f) Staggered walk
    - (g) Anorexia
    - (h) Dermatitis
    - (i) Bone marrow depression
    - (j) Abdominal pain
- b. Toluene
  - (1) Routes of entry
    - (a) Inhalation
    - (b) Ingestion
    - (c) Dermal contact
    - (d) Absorption
  - (2) Acute symptoms
    - (a) Fatigue
    - (b) Weakness
    - (c) Confusion
    - (d) Euphoria
    - (e) Dizziness
    - (f) Headache
    - (g) Dilated pupils
    - (h) Muscle fatigue
    - (i) Lacrimation
    - (j) Insomnia
    - (k) Paresthesia
    - (l) Dermatitis
    - (m) Photophobia
- c. Ethylbenzene
  - (1) Routes of entry
    - (a) Inhalation
    - (b) Ingestion
    - (c) Dermal contact
  - (2) Acute symptoms
    - (a) Eye and skin irritations
    - (b) Headache
    - (c) Dermatitis

- (d) Narcosis
- (e) Coma
- d. Xylenes (ortho/meta/para isomers)
  - (1) Routes of entry
    - (a) Inhalation
    - (b) Ingestion
    - (c) Dermal contact
    - (d) Absorption
  - (2) Acute Symptoms
    - (a) Eyes, nose, throat and skin irritation
    - (b) Drowsiness
    - (c) Dizziness
    - (d) Excitement
    - (e) Incoherence
    - (f) Staggered walk
    - (g) Nausea
    - (h) Vomiting
    - (i) Abdominal pain
    - (j) Dermatitis

#### IV. TRAINING

- A. Potential Hazards - All personnel working at the site are made aware of all potential on-site hazards prior to the beginning of field work.
- B. Safe Work Practices - All personnel at the site are advised of safe work practices and hazard avoidance.
- C. SSP - All personnel, including subcontractors of EIS and all visitors to the site work areas, are to read the SSP and sign an acknowledgment indicating that they have reviewed and understand its contents.
- D. OSHA - All EIS Macoy resource Corporation and the Geoprobe Drilling Company field personnel have completed a minimum of 40-hour OSHA training and are updated annually with an 8-hour refresher course.

#### V. PERSONAL PROTECTIVE EQUIPMENT

- A. Level "D" protection for field crew installing soil borings and soil sampling:
  - 1. Chemically resistant steel-toed boots
  - 2. Hard hat
  - 3. Safety glasses - Eye protection must be worn whenever the potential for flying debris and or chemical splash is present.
  - 4. Hearing protection
  - 5. Leather gloves
  - 6. Denim or equivalent long pants
  - 7. Button up shirt

#### VI. HEALTH SURVEILLANCE

- A. Health surveillance will be on an individual and on a "buddy system" basis.
- B. All personnel are advised to pay particular attention for the symptoms of chemical exposure outlined in Appendix A.

## VII. EXPOSURE MONITORING PLAN

At the direction of the site safety officer exposure monitoring shall consist of:

- A. Direct observation for excessive fumes, dust or vapor clouds, or excessively noxious odors; or
- B. Direct reading instruments:  
(Equipment use depends on site-specific conditions).  
photo-ionization detector (PID), or a field gas chromatograph

## VIII. SITE CONTROL

- A. Work Zones - Areas will be designated after utility location survey and site reconnaissance with Macoy Resources Corp personnel and placed on site map and will be indicated in pre-field meeting.
  - 1. Exclusion Zone
    - a. Where work is performed, with all proper safety equipment, and employing safe work practices.
    - b. Public is excluded.
    - c. Area is barricaded with barricades, cones and/or caution tape.
    - d. Cones placed to guide public away from work area.
  - 2. Contamination Reduction Zone
    - a. Located outside the exclusion zone.
    - b. Place where personnel and/or equipment are decontaminated in the event of contact with hazardous chemicals, from either the soil, water and/or air (vapors).
  - 3. Support Zone
    - a. Clean zone or Support zone is located outside Contamination Reduction Zone.
    - b. Contains all job related support equipment and/or services.
- B. Location of Nearest Communication Equipment
  - 1. Cell phones on all responsible workers.
  - 2. All persons in the various zones will have remote communication equipment if necessary.
- C. Location of Nearest Medical Assistance
  - 1. On-site map shows nearest hospital. See Page 1 for address and telephone number.
- D. On-site Communication
  - 1. All personnel on-site will be made aware of common hand signals.
- E. Engineering Controls
  - 1. Site Map
    - a. Indicates work locations.

## IX. DECONTAMINATION

### A. Material Handling

1. All sampling equipment will be clean prior to use
2. Contaminated equipment will be taken off-site only after decontamination.
3. Disposal of wash and rinse water will be in compliance with all applicable regulations.

### B. Personal Hygiene

1. No smoking, eating, or drinking will take place in the exclusion zone or in the contamination reduction zone.
2. A designated break area may be established off-site. However, if smoking or open flames are permitted, any such facility must be established a minimum of at least 100 feet upwind of any of any vapor source and shall be tested for flammable gases and vapor at the start of work and prior to scheduled break periods each day.
3. Personnel must wash all exposed skin areas with soap and water in the decontamination area before departing the site or going on break.

## X. STANDARD OPERATING PROCEDURES

- A. Pre-project safety meeting prior to working.
- B. Sampling equipment calibrated before use.
- C. Respirator fit test (if required).
- D. Site work performed.
- E. Decontamination protocol followed.

## XI. CONTINGENCY PLAN / EMERGENCY PROCEDURES

### A. Personal Exposure (First Aid)

1. In the event that exposure symptoms are manifested, the victim will be taken up-wind and off-site. Seek qualified medical attention immediately.
2. Consult NIOSH Pocket Guide to Chemical Hazards prior to rendering first aid. Wash skin with soap and water immediately.
3. Inhalation - Move to fresh air and administer immediate artificial respiration if required.
4. Ingestion - Do not induce vomiting. If conscious, give water or milk to drink. Seek qualified medical attention immediately.
5. Eyes - Flush with water for at least 20 minutes while holding eyes open. Seek qualified medical attention immediately.

### B. Personal Injury- (Supervisors and field employees are trained in First Aid and CPR).

1. Provide basic first aid procedures as required; note time and circumstances of injuries. Follow these emergency action procedures:
  - a. Survey the scene.
    - (1) Is it safe to assist victim(s).
  - b. Conduct a Primary Survey
    - (1) Check for unresponsiveness and Airway, Breathing, and Circulation.

- c. Phone 911 for ambulance if necessary.
- d. Conduct a Secondary Survey.
  - (1) Interview victim
  - (2) Check vital signs
  - (2) Head to toe exam
- e. Transport to nearest medical facility as appropriate. Notify SSO. See directions and map in Appendix B for the nearest hospital emergency room.

C. Fire and Explosion Potential

- 1. Evacuate the area immediately and conduct a head count of all personnel. Notify fire department. Do not attempt to fight the fire. A fire extinguisher will be present on-site for immediate response by on OSHA certified person.

XII. LIST OF APPROPRIATE REFERENCE LITERATURE

- A. Title 29 CFR 1910 - OSHA General Industry Standard
- B. Title 29 CFR 1926 - OSHA Construction Standard
- C. Title 49 CFR 171-173 - DOT Regulations

APPENDIX A.

A. Potential Hazards

- 1. Exposure to Hazardous Chemicals
  - a. Hazardous / Toxic Materials
    - (1) Possible that the presence of BTEX in the shallow soil and groundwater exists.
  - b. Hazard Assessment
    - (1) Moderately toxic chemicals through inhalation, ingestion, absorption and skin contact, but possess good warning properties.
    - (2) Highly flammable and explosive when vapor concentrations range from 0.8 to 6% by volume.
- 2. Chemical Listing
  - a. **Benzene**
    - (1) Permissible exposure limit (PEL) = 10 ppm with a ceiling of 50 ppm for 10 minutes. (NIOSH)
    - (2) Action Level = 0.05 ppm
    - (3) Immediately Dangerous to Life or Health (IDLH) at 3,000 parts per million
      - (a) Carcinogenic
    - (4) Physical Properties
      - (a) Vapor pressure = 75 mm mercury
      - (b) Lower explosion limit (LEL) = 1.3%
      - (c) Upper explosion limit (UEL) = 7.9%
      - (d) Class 1B flammable liquid
    - (5) Target Organs
      - (a) Central Nervous System (CNA)

- (b) Skin
- (c) Blood
- (d) Eyes
- (e) Respiratory system
- (f) Bone marrow

**b. Toluene**

- (1) Permissible exposure limit (PEL) = 200 ppm with a maximum exposure of 500 ppm for 10 minute peak.
- (2) Action Level = 50 ppm
- (3) Immediately Dangerous to Life or Health (IDLH) at 2,000 parts per million
- (4) Physical Properties
  - (a) Vapor pressure = 22 mm mercury
  - (b) Lower explosion limit (LEL) = 1.2%
  - (c) Upper explosion limit (UEL) = 7.1%
  - (d) Class 1B flammable liquid
- (5) Target Organs
  - (a) Central Nervous System (CNA)
  - (b) Skin
  - (c) Liver
  - (d) Kidneys

**c. Ethylbenzene**

- (1) Permissible exposure limit (PEL) = 100 ppm
- (2) Action Level = 50 ppm
- (3) Immediately Dangerous to Life or Health (IDLH) at 2,000 parts per million
- (4) Physical Properties
  - (a) Vapor pressure = 10 mm mercury
  - (b) Lower explosion limit (LEL) = 1.0%
  - (c) Upper explosion limit (UEL) = 6.7%
  - (d) Class 1B flammable liquid
- (5) Target Organs
  - (a) Central Nervous System (CNA)
  - (b) Skin
  - (c) Upper respiratory system
  - (d) Eyes

**d. Xylenes (ortho/meta/para isomers)**

- (1) Permissible exposure limit (PEL) = 100 ppm with maximum exposure of 200 ppm for 10 minutes.
- (2) Action Level = 50 ppm
- (3) Immediately Dangerous to Life or Health (IDLH) at 1,000 parts per million
- (4) Physical Properties
  - (a) Vapor pressure = 7/9/9 mm mercury
  - (b) Lower explosion limit (LEL) = 1/1.0/1.1%
  - (c) Upper explosion limit (UEL) = 7/7/7%
  - (d) Class 1B flammable liquid - o xylene
  - (e) Class 1C flammable liquid - m,p xylenes
- (5) Target Organs

- (a) Central nervous system
- (b) Eyes
- (c) Liver
- (d) Kidneys
- (e) Skin
- (f) Blood
- (g) Gastro-intestinal tract

**First Aid:** 1. Get medical assistance for all cases of overexposure. Eyes: flush thoroughly with water. Skin: wash with soap and water. Inhalation: remove to fresh air. Ingestion: if conscious, induce vomiting.

Table 1- Summary of Soil Gas Sample Analytical Results  
461 McGraw Ave, Livermore, California

Sample	Depth	Date	2-Butanone (MEK)	2-Hexanone	Acetone	Benzene	Chloroform	Ethylbenzene	4-Ethyl Toluene	Isopropanol	Hexane	Methylene Chloride	PCE	Toluene	TCE	Trichlorofluoromethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Total Xylenes	Carbon Disulfide	Styrene
SG-5	4'	12/14/2007	72	<2.0	12000	25	<2.4	120	<2.5	<16	<3.5	<3.6	130	12000	<2.7	3.6	<2.5	<2.5	590	<1.6	24
SG-6	4'	12/14/2007	40	<2.0	8900	15	<2.4	150	<2.5	<16	<3.5	<3.6	100	18000	<2.7	34	<2.5	<2.5	610	<1.6	19
SG-7B	4'	12/15/2007	<1.5	<2.0	140	5.8	<2.4	<1.7	<2.5	<16	<3.5	<3.6	73	14	<2.7	250	<2.5	<2.5	12.5	2.7	<2.1
SG-8	4'	12/14/2007	11	2.9	52	19	<2.4	4.2	<2.5	17	<3.5	<3.6	45	18	<2.7	17	<2.5	<2.5	15.5	<1.6	<2.1
SG-9	4'	12/15/2007	6.1	<2.0	150	1.9	<2.4	<1.7	<2.5	4300	<3.5	<3.6	<b>3100</b>	6.9	<2.7	58	<2.5	<2.5	18.8	5.2	<2.1
SG-9	8'	12/14/2007	13	3.7	58	14	<2.4	<1.7	<2.5	<16	<3.5	<3.6	<b>40000</b>	12	17	220	<2.5	<2.5	10.5	2.3	<2.1
SG-10	4'	12/14/2007	7.5	<2.0	23	3.5	<2.4	<1.7	<2.5	<16	<3.5	<3.6	<b>4600</b>	2.5	21	330	4.0	<2.5	11.7	<1.6	<2.1
SG-11	4'	12/14/2007	<1.5	<2.0	71	3.3	<2.4	<1.7	<2.5	420	30	<3.6	<3.4	16	<2.7	<2.5	<2.5	<2.5	9.2	<1.6	<2.1
SG-12	4'	12/14/2007	<1.5	<2.0	11	1.7	<2.4	<1.7	<2.5	<16	<3.5	34	<3.4	3.5	<2.7	<2.5	<2.5	<2.5	5.2	<1.6	<2.1
SG-13	4'	12/14/2007	7.8	<2.0	28	9.3	<2.4	<1.7	<2.5	<16	<3.5	<3.6	<b>4300</b>	7.0	<2.7	1100	2.6	<2.5	5.7	<1.6	<2.1
SG-14	4'	12/15/2007	160	<2.0	190	<1.6	30	<1.7	<2.5	<16	37	140	<b>1300</b>	15	<2.7	23	<2.5	<2.5	20	9.5	<2.1
SG-14	8'	12/15/2007	220	<2.0	920	49	220	<1.7	<2.5	<16	350	<3.6	<b>4400</b>	74	<2.7	<2.5	<2.5	<2.5	56	73	26
SG-15	4'	12/14/2007	10	<2.0	56	4.1	<2.4	<1.7	<2.5	<16	<3.5	<3.6	59	8.0	<2.7	290	<2.5	<2.5	7.2	4.2	<2.1
SG-16	4'	12/15/2007	<1.5	<2.0	83	3.3	<2.4	<1.7	<2.5	<16	<3.5	<3.6	110	9.7	<2.7	14	<2.5	<2.5	10.7	5.8	<2.1
SG-17	4'	12/15/2007	<1.5	<2.0	36	<1.6	<2.4	<1.7	<2.5	<16	<3.5	<3.6	120	5.5	<2.7	3.4	<2.5	<2.5	<2.2	<1.6	<2.1
SG-18	4'	12/14/2007	<1.5	<2.0	55	3.1	<2.4	<1.7	<2.5	<16	<3.5	<3.6	16	8.4	<2.7	76	<2.5	<2.5	7.1	<1.6	<2.1
SG-19	4'	12/15/2007	4.0	<2.0	87	2.6	<2.4	<1.7	<2.5	<16	<3.5	<3.6	59	8.9	<2.7	10	<2.5	<2.5	8.3	4.8	<2.1
SG-20	4'	12/14/2007	<1.5	<2.0	32	2.3	<2.4	<1.7	<2.5	<16	<3.5	<3.6	190	3.3	<2.7	84	<2.5	<2.5	4.7	<1.6	<2.1
SG-21	4'	12/14/2007	7.5	<2.0	180	<1.6	<2.4	<1.7	<2.5	35	<3.5	<3.6	<b>4100</b>	150	<2.7	260	<2.5	<2.5	7.3	<1.6	<2.1
SG-22	4'	12/15/2007	<1.5	<2.0	86	2.8	<2.4	<1.7	6.3	<16	<3.5	<3.6	<b>24000</b>	9.4	12	500	8.7	2.7	15.8	15	<2.1
SG-23	4'	12/15/2007	6.8	<2.0	72	3.3	<2.4	<1.7	<2.5	<16	<3.5	<3.6	330	12	<2.7	350	<2.5	<2.5	11.3	8.0	<2.1
SG-24	4'	12/15/2007	<1.5	<2.0	55	7.8	<2.4	<1.7	5.2	<16	56	<3.6	250	28	<2.7	270	6.5	<2.5	15.6	28	<2.1
CHHSL Shallow Soil Gas Screening Levels:			--	--	--	36.2	--	--	--	--	--	--	180	135,000	--	--	--	--	315,000	--	--
RWQCB Shallow Soil Gas Screening Levels:			--	--	660,000	84	460	210,000	--	--	--	5,200	410	63,000	1200	--	--	--	21,000	--	190,000

Notes: -- Not Established **Bold** = results which are greater than the Nov 2007 RWQCB Soil Gas Screening Levels (Residential Land Use)  
 Data and Shallow Soil Gas Screening Levels are reported in micrograms per liter (ug/m3)  
 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. (2005)  
 RWQCB ESL Soil Gas Screening Levels are based on soil gas data collected less than 3.0 meters (10 feet) below a building foundation or ground surface. Intended for evaluation of potential indoor-air impacts for Residential Land Use. (Nov 2007)  
 TCE = Trichloroethene PCE = Tetrachloroethene EPA Method TO-15 for Toxic Organics in Air



Table 2 - Summary of Soil Sample Analytical Results  
461 McGraw Avenue, Livermore, California

Boring	Depth (feet)	Date	TPH-d	TPH-mo	TPH-g	MTBE	Benzene	Toluene	PCE	Ethylbenzene	Total Xylenes	Naphthalene	n-Propyl benzene	n-Butyl benzene	sec-Butyl benzene	1,2,4-Trimethyl benzene	1,3,5-Trimethyl benzene
B10 @ 3.5'	3.5	11/21/2007	<b>1600,a/m</b>	520	<0.25	<0.005	<0.005	<0.005	0.13	0.069	0.47	<b>1.9</b>	0.11	0.23	0.088	0.66	0.26
B10 @ 8'	8.0	11/21/2007	2.0,b	<5.0	<0.25	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B10A @ 3.5'	3.5	11/21/2007	<b>3100,a/m</b>	1100	<0.25	<0.005	<0.005	<0.005	0.18	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01
B12 @ 2'	2.0	11/21/2007	<b>3200,a/m</b>	880	<0.25	<0.005	<0.005	<0.005	0.0071	<0.005	<0.005	<0.005	<0.005	<0.005	0.056	<0.005	0.08
B20 @ 1.0'	1.0	12/5/2007	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B20 @ 4.0'	4.0	12/5/2007	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B20 @ 7.5'	7.5	12/5/2007	NA	NA	NA	<0.005	<0.005	<0.005	0.0075	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B-30A@3.5'	3.5	12/17/2007	1.5,b	<5.0	<0.25	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B-30A@7.5'	7.5	12/17/2007	15,g,b	17	<0.25	<0.005	<0.005	<0.005	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B-37@15.5'	15.5	1/25/2008	NA	NA	NA	<0.005	<0.005	<0.005	0.083	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B-37@19.5'	19.5	1/25/2008	NA	NA	NA	<0.005	<0.005	<0.005	0.13	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RWQCB ESL			83	4,100	83	0.023	0.044	2.9	0.34	3.3	2.3	1.3	--	--	--	--	--
USEPA PRG			--	--	--	32	0.64	520	0.48	400	270	--	240	240	220	52	21

Notes:

Data are reported in milligrams per kilogram (mg/kg)  
 TPH-d = Total Petroleum Hydrocarbons as diesel  
 TPH-g = Total Petroleum Hydrocarbons as gasoline  
 TPH-mo = Total Petroleum Hydrocarbons as oil

MTBE = Methyl tert-butyl ether  
 BTEX = Benzene, Toluene, Ethylbenzene, Xylenes  
 VOCs = Volatile Organic Compounds  
 NA = Not Analyzed

Method 8015C for TPH-d and TPH-mo  
 Method 8260B for TPH-g, VOCs, and Fuel Oxygenates  
**Bold** = results which are greater than the Nov 2007 RWQCB Shallow Soil ESL

RWQCB ESL = Regional Water Quality Control Board's Shallow Soil Environmental Screening Level for Residential Property where groundwater is currently or potentially a drinking water resource. (Nov 2007)

USEPA PRG = United States Environmental Protection Agency's Preliminary Remediation Goal for residential soil. (2004)

a) unmodified or weakly modified diesel is significant  
 m) fuel oil

b) diesel range compounds are significant; no recognizable pattern  
 g) oil range compounds are significant

Table 3 - Summary of Grab Groundwater Sample Analytical Results  
461 McGraw Avenue, Livermore, California

Boring	Total Depth	Date	TPH-g	TPH-d	TPH-mo	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	PCE	Trichloro fluoro methane	Chloroform	Acetone	Other VOCs	Other Oxygenates
B-1	27'	6/1/2007	<50	<500	<500	<2.000	<1.000	<1.000	<1.000	<3.000	<1.000	<1.000	<1.000	<5.00	ND	ND
B-2	28'	5/31/2007	<50	<500	<500	<2.000	<1.000	<1.000	<1.000	<3.000	<1.000	<1.000	<1.000	<5.00	ND	ND
B-3	25'	5/31/2007	<50	<500	<500	<2.000	<1.000	<1.000	<1.000	<3.000	<1.000	<1.000	<1.000	<5.00	ND	ND
B-4	30'	5/31/2007	<50	<500	<500	<2.000	<1.000	<1.000	<1.000	<3.000	<1.000	<1.000	<1.000	<5.00	ND	ND
B-5	31'	5/31/2007	<50	<500	<500	<2.000	<1.000	<1.000	<1.000	<3.000	<1.000	<1.000	<1.000	<5.00	ND	ND
B-6	30'	5/31/2007	<50	<500	<500	<2.000	<1.000	<1.000	<1.000	<3.000	<1.000	<1.000	<1.000	<5.00	ND	ND
B-7	16'	11/26/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-8	18'	11/26/2007	NA	NA	NA	<0.5	<0.5	0.55	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-9	19.5'	11/26/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-10	18'	11/26/2007	<50	84,b	<250	<0.5	<0.5	<0.5	<0.5	<0.5	<b>27</b>	<0.5	1.1	<10	ND	ND
B-11	18'	11/26/2007	NA	NA	NA	<10	<10	<10	<10	<10	<b>530</b>	<10	<10	<200	ND	ND
B-12	18'	11/26/2007	120,f	54,b	<250	<5.0	<5.0	<5.0	<5.0	<5.0	<b>230</b>	<5.0	<5.0	<100	ND	ND
B-13	18'	11/26/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.77	<0.5	20	ND	ND
B-14	19.5'	11/26/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<b>26</b>	<0.5	<0.5	<10	ND	ND
B-15	19'	12/6/2007	NA	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<b>140</b>	<5.0	<5.0	<100	ND	ND
B-16	19'	12/6/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-17	19'	12/6/2007	NA	NA	NA	<0.5	<0.5	0.78	<0.5	<0.5	2.2	<0.5	0.60	<10	ND	ND
B-18	19'	12/6/2007	NA	NA	NA	<0.5	<0.5	1.3	<0.5	<0.5	0.86	<0.5	3.5	<10	ND	ND
B-19	19'	12/6/2007	NA	NA	NA	<10	<10	<10	<10	<10	<b>280</b>	<10	<10	<200	ND	ND
B-20	32'	12/5/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-21	19'	12/6/2007	NA	NA	NA	<0.5	<0.5	1.7	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-22	19'	12/6/2007	NA	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<b>170</b>	<5.0	<5.0	<100	ND	ND
B-23	27'	12/6/2007	NA	NA	NA	<0.5	<0.5	1.4	<0.5	1.3	<0.5	0.98	<0.5	13	ND	ND
B-24	19'	12/6/2007	NA	NA	NA	<0.5	<0.5	7.4	1.4	6.2	<b>5.8</b>	<0.5	<0.5	<10	ND	ND
B-25	19'	12/6/2007	NA	NA	NA	<0.5	<0.5	1.2	<0.5	0.52	<b>28</b>	<0.5	<0.5	<10	ND	ND
B-26	19'	12/6/2007	NA	NA	NA	<50	<50	<50	<50	<50	<b>1500</b>	<50	<50	<1000	ND	ND
B-27	19'	12/6/2007	NA	NA	NA	<0.5	<0.5	0.88	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-28	19'	12/6/2007	NA	NA	NA	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-29	20'	12/18/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	1.9	<0.5	<0.5	150	ND	ND
B-30A	15'	12/18/2007	NA	NA	NA	<50	<50	<50	<50	<50	<b>1800</b>	<50	<50	<1000	ND	ND
B-30B	20'	12/18/2007	NA	NA	NA	<25	<25	<25	<25	<25	<b>810</b>	<25	<25	<500	ND	ND
B-30C	25'	12/18/2007	NA	NA	NA	<17	<17	<17	<17	<17	<b>600</b>	<17	<17	<330	ND	ND
B-31	20'	12/18/2007	NA	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<b>190</b>	<5.0	<5.0	<100	ND	ND
B-32	20'	12/18/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<b>11</b>	<0.5	<0.5	110	ND	ND
B-33	20'	12/18/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<b>7.1</b>	<0.5	<0.5	70	ND	ND
B-34	20'	12/18/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-35	20'	12/18/2007	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-36	20'	12/18/2007	NA	NA	NA	<12	<12	<12	<12	<12	<b>600</b>	<12	<12	<250	ND	ND
B-26@28	28'	1/25/2008	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<10	ND	ND
B-26@33	33'	1/25/2008	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
B-26@38	38'	1/25/2008	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	0.68	<0.5	<0.5	37	ND	ND
B-26@45	45'	1/25/2008	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	ND	ND
CDHS MCL			--	--	--	5 <sup>(a)</sup>	1	150	300	1,750	5	--	70	--	--	--
Drinking Water ESLs			210	210	210	13	1.0	150	300	1,800	5	--	70	6300	--	--

Notes: Data are reported in micrograms per liter (µg/L)      VOCs = Volatile Organic Compounds      -- = Not Established  
 TPH-g = Total Petroleum Hydrocarbons as gasoline      MTBE = Methyl tert-Butyl Ether      ND = Not Detected  
 TPH-d = Total Petroleum Hydrocarbons as diesel      PCE = Tetrachloroethene      NA = Not analyzed  
 BTEX = Benzene, Toluene, Ethylbenzene, Xylenes      TPH-mo = Total Petroleum Hydrocarbons as Motor Oil      Method 8260B for VOCs

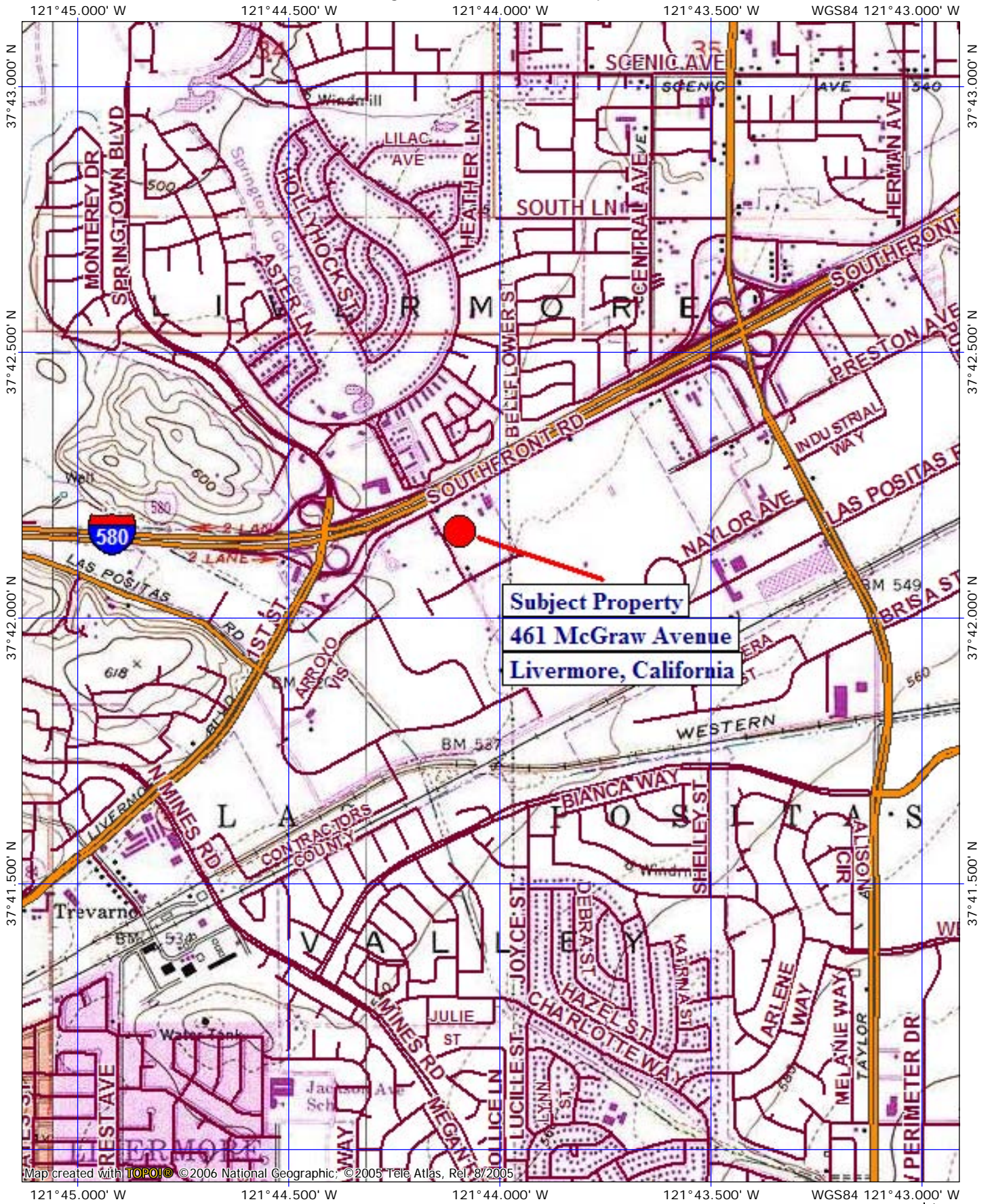
(a) = This is the secondary MCL for MTBE, which is based on qualitative factors such as taste and odor. The primary MCL for MTBE, the value that has been determined to be protective of human health, is 13 micrograms per liter.

Drinking Water ESLs = Regional Water Quality Control Board's Environmental Screening Levels for drinking water. (Nov 2007)  
 CDHS MCL = California Department of Health Services' Maximum Contaminant Level for Drinking Water, CCR, Title 22, 2005

**Bold** = results which are greater than the CDHS MCL

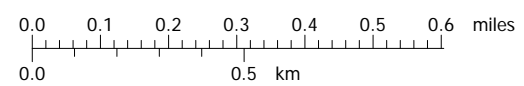


Figure 1 : Site Location Map

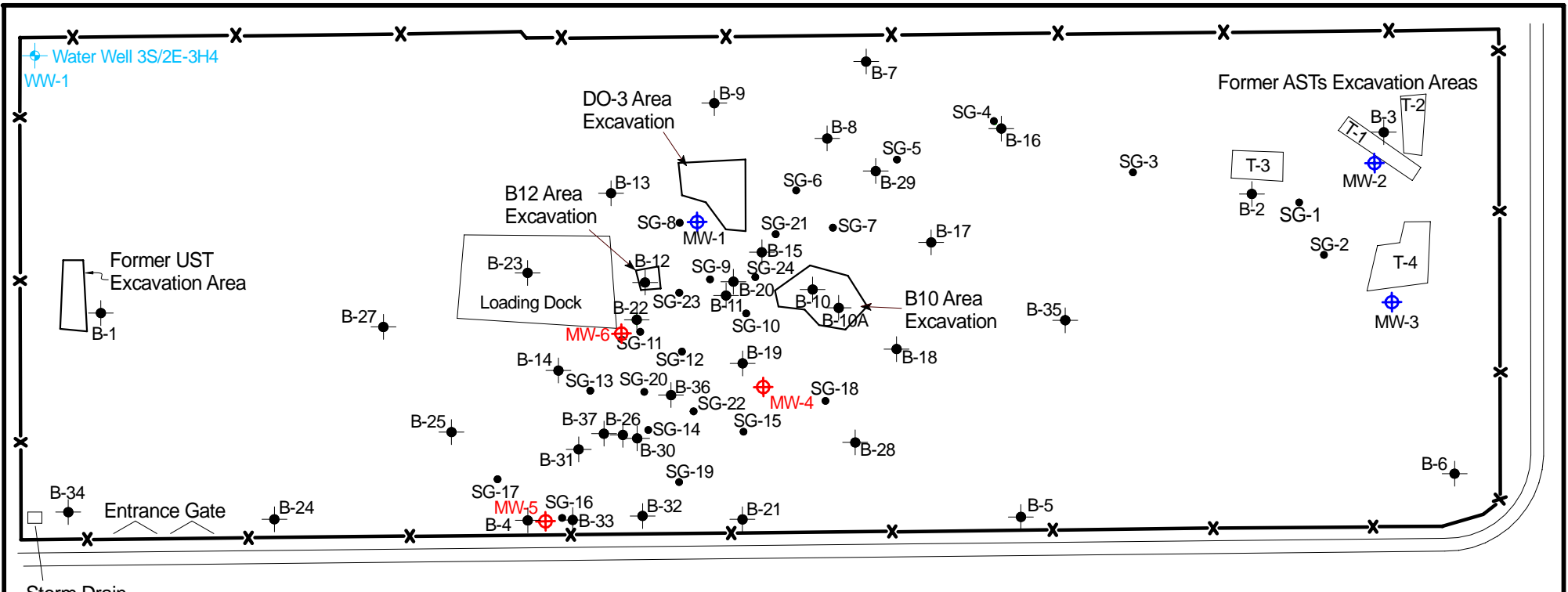


Map created with TOPO!® ©2006 National Geographic. ©2005 Tele Atlas, Ref. 8/2005

121°45.000' W 121°44.500' W 121°44.000' W 121°43.500' W WGS84 121°43.000' W







McGraw Avenue



Scale:  
1" = 60'



LEGEND	
	Soil Boring Location
	Monitoring Well Location
	Proposed Monitoring Well Location
	Water Well 3S/2E-3H4 to be decommissioned
	Soil Gas Sample Location
	Fence / Property Line

Environmental Investigation Services, Inc.  
170 Knowles Drive, Suite 212, Los Gatos, California 95032  
Phone: (408) 871-1470 Fax: (408) 871-1520

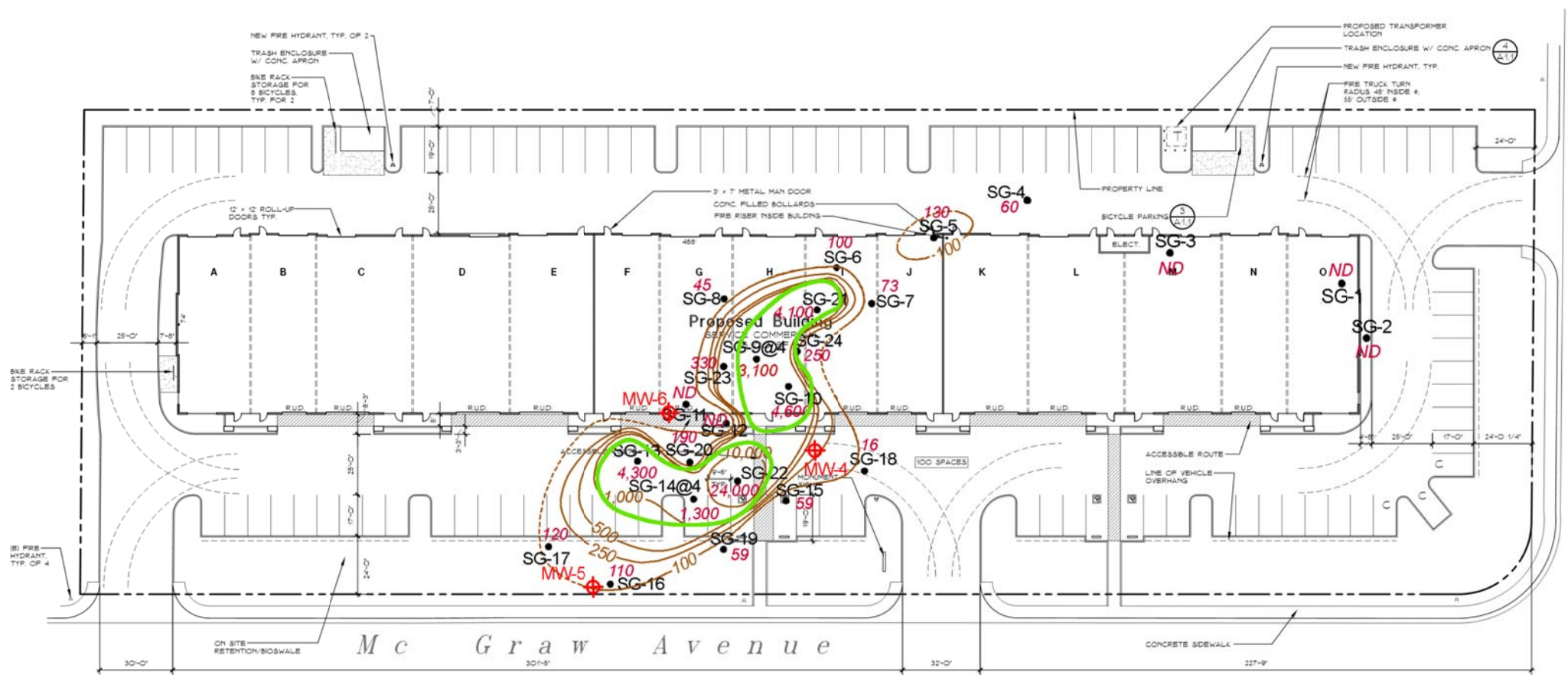
Project Number 717-4

February 06, 2008

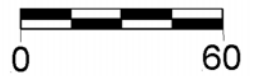
Figure 2

Site Overview  
461 McGraw Avenue  
Livermore, California





Scale:  
1" = 60'



LEGEND	
● SG-3	Soil Gas Sample Location
---	Fence / Property Line
BGS =	Below Ground Surface
○	Proposed Excavation Area
○	PCE Concentration Contour (µg/m³) dashed where inferred
170	PCE Concentration (µg/m³)
ND	PCE Not Detected
⊕	Proposed Monitoring Well Location
MW-3	

Environmental Investigation Services, Inc.  
170 Knowles Drive, Suite 212, Los Gatos, California 95032  
Phone: (408) 871-1470 Fax: (408) 871-1520

Project Number 717-4

February 06, 2008

Figure 4

PCE Concentrations in Soil Gas  
with Proposed Pit Excavations  
461 McGraw Avenue  
Livermore, California