TRC
Customer-Focused Solutions

May 20, 2005

TRC Project No. 42-0145-02

Mr. Don Hwang
Alameda County Environmental Health Services
1131 Harbor Bay Parkway
Suite 250
Alameda, California 94502-6577

SITE: 76 STATION NO. 4625
3070 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

RE: ADDITIONAL SOIL AND GROUNDWATER INVESTIGATION WORK PLAN

Dear Mr. Hwang:

On behalf of ConocoPhillips Company (ConocoPhillips), TRC submits this work plan for additional site assessment at 76 Station No. 4625, located at 3070 Fruitvale Avenue in Oakland, California (Figure 1). This work is being performed pursuant to a request by the Alameda County Environmental Health Services (ACEHS) to ConocoPhillips, in a letter dated February 9, 2005. The due date for submittal of the workplan was extended by ACEHS on March 29, 2005 from April 9, 2005 to May 23, 2005.

1.0 PROJECT OBJECTIVES AND SCOPE OF WORK

The objective of this assessment is to characterize vertical and lateral distribution of dissolved-phase hydrocarbons, including methyl tertiary butyl ether (MTBE), in site soil and groundwater.

The scope of work for this assessment includes the following:

- Construction of three offsite groundwater-monitoring wells.
- Collection of groundwater and soil samples for analysis at a state-certified laboratory.
- Preparation of a final technical report documenting soil boring activities, well installation and development, groundwater sampling procedures, laboratory results, waste characterization, and disposal.

2.0 SITE DESCRIPTION

The site is an operating service station located on the northwest corner of Fruitvale Avenue and School Street in Oakland, California (Figure 2). The current site facilities include a station building with two automotive service bays equipped with hydraulic lifts, four dispenser islands

and two canopies, two 12,000-gallon double-wall fiberglass gasoline underground storage tanks (USTs), and one above ground waste-oil tank. Six groundwater monitoring wells and one UST observation well are present at the site.

2.1 Geology and Hydrogeology

The site is located on the western flank of the Oakland Hills in an area underlain by Holocene age alluvium. The alluvial deposits are composed of unconsolidated, moderately sorted, permeable silt with coarse sand and gravel. The northwest trending Hayward fault is located approximately 1,500 feet northeast of the site (Helley, 1979). The nearest surface waters are Sausal Creek, located approximately 500 feet west of the site, and Peralta Creek, located 2,300 feet southeast of the site. Additionally, East Bay Municipal Utility District's Central Reservoir is located approximately 1,300 feet west of the site.

3.0 SITE BACKGROUND

The site is currently an active service station located on the southeast corner of Fruitvale Avenue and School Street in Oakland, California.

April/May 1998: The gasoline underground storage tanks (USTs), product piping and dispensers were removed and replaced. Concentrations of total petroleum hydrocarbons as gasoline (TPH-g), benzene, and MTBE ranged from non-detect to moderate levels.

May 1998: A waste oil UST and associated piping was also removed. Concentrations of TPH-g, benzene, total petroleum hydrocarbons as diesel (TPH-d), total oil and grease (TOG), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals ranged from non-detect to moderate levels.

A total of approximately 1,166 tons of soil were over excavated and transported from the site to Allied Waste's Forward Landfill in Manteca, California. Additionally, 40,000 gallons of groundwater were pumped from the UST pit and transported to the Tosco Refinery in Rodeo, California for disposal. A conductor casing was installed in the backfill during installation of the replacement gasoline USTs. The waste oil tank was replaced with an aboveground tank.

April 2000: Four monitoring wells were installed at the site.

May 2003: Two monitoring wells were installed to 25 feet below ground surface (fbg) and two exploratory borings were advanced to approximately 15 fbg. Soil samples contained low maximum levels of benzene, MTBE, and tertiary butyl alcohol (TBA), and moderate levels of TPH-g. Grab groundwater samples collected from the two soil borings were reported to contain elevated concentrations of petroleum hydrocarbons in both samples.

October 2003: Site environmental consulting responsibilities were transferred to TRC.

4.0 SITE ASSESSMENT ACTIVITIES

TRC proposes to construct three offsite monitoring wells for the purpose of assessing groundwater quality and flow gradient. The three wells will be located in the presumed downgradient direction from the existing USTs and dispenser islands as shown on Figure 2. The presumed west-southwesterly flow direction is inferred from site data collected since the beginning of 2002, as shown on Figure 3.

4.1 Preferential pathways

In July, 2000, Alameda County conducted a ½ mile radius well search in the site vicinity. The well search did not identify any municipal, industrial, or domestic water wells in the search area. One irrigation well was identified approximately 1,700 feet south-southeast of the site. It is unknown whether the irrigation well is currently active (Gettler-Ryan Inc., 2001).

In general, subsurface soils are composed of clay and silt to depths of approximately 9 to 19 feet below ground surface (fbg), underlain by gravel with varying amounts of clay and sand to depths of approximately 18 to 22 fbg, which in turn is underlain by clay and silt to 25 fbg, the maximum depth explored. The exception was well boring MW-1, in which only clay was encountered to 25 fbg (Gettler-Ryan Inc., 2003). Consequently, groundwater flow and plume migration is most likely to occur in the most conductive zone. The most conductive zone at the site is gravel with varying amounts of clay and sand, which is approximately 18 to 22 fbg.

Underground utilities at the site include sewer/storm water, product piping, and water pipes. Product and water pipes are located in the downgradient groundwater flow direction only. Product piping is confined to the site and is an unlikely conduit for hydrocarbon migration. Water pipes extend offsite and trend in the downgradient direction. Depth to groundwater at the site during quarterly monitoring activities has historically approximated around 10 fbg. Since underground utilities are typically buried within the first five feet, there is a low probability of underground utilities acting as preferential pathways.

4.2 Pre-Field Activities

Prior to commencing well installation activities, drilling and encroachment permits will be acquired from the City of Oakland and Alameda County Public Works Agency. Underground Service Alert (USA) will be notified at least two days prior to field activities to mark underground utilities at the property boundaries. Prior to drilling each boring, a pilot hole will be hand augured to approximately 5 fbg to verify the absence of buried utilities.

A site and job specific health and safety plan that promotes personnel safety and preparedness during the planned activities has been developed and is included in Appendix A. On the morning of the day that the field activities are to commence, a "tailgate" meeting will be

conducted with all exclusion zone workers to discuss the health and safety issues and concerns related to the specific work.

4.3 Monitoring Well Installation

Three groundwater-monitoring wells (MW-7, MW-8, and MW-9) will be installed to a depth of approximately 25 fbg using a hollow-stem auger drill rig. Proposed monitoring well locations are shown in Figure 2. The monitoring wells will be installed southwest of the underground storage tanks. The wells will be installed on Fruitvale Avenue directly across the road from the 76 service station to characterize the extent of dissolved-phase hydrocarbons, including MTBE. Soil samples will be collected at five-foot depth intervals using a split-spoon sampler. Samples will be collected for soil description in accordance with the Unified Soil Classification System (ASTM D-2487), field hydrocarbon vapor testing, and analysis at a State-certified laboratory. General field procedures to be followed during this investigation are discussed in Appendix B.

The soil samples will be screened in the field using a hand-held organic vapor meter equipped with a photo-ionization detector (PID). Samples will be selected for laboratory analysis based on the PID screening levels and any observed hydrocarbon impact such as staining, sheen, free product, or hydrocarbon odor. At least two soil samples per boring will be submitted to a State-certified laboratory for analysis, one of which will be the soil sample collected from the capillary fringe from each boring. The selected soil samples will be properly preserved and transported to the laboratory under appropriate chain-of-custody protocol. The soil samples will be analyzed for the following:

- Total purgeable petroleum hydrocarbons (TPPH) by EPA Method 8260B
- Benzene, toluene, ethyl benzene, total xylenes (BTEX) by Method 8260B
- Methyl tertiary butyl ether (MTBE), tert-butyl ether (TBA), di-isopropyl ether (DIPE), tert-amyl ether (TAME), ethyl tert-butyl ether (ETBE) 1,2-dichloroethane (1,2-DCA), 1,2-dibromoethane (EDB), and ethanol by EPA Method 8260B.

The proposed monitoring wells will be constructed of 2-inch diameter polyvinyl chloride (PVC) blank (riser) and slotted screen (0.020). The well screen interval will be determined from lithologic data collected from the exploratory borings. The screen formation annulus will be filled with an appropriate filter pack material. The riser formation annulus will be properly sealed with hydrated bentonite chips and cement grout. The wellhead will be sealed with a watertight, lockable well cap. A flush-mounted, watertight, traffic-rated well box will be installed over the wellhead.

Following installation of the filter pack, the well will be developed (surged and bailed) to improve hydraulic communication between the geologic formation and the well. A wellhead reference point, typically a notch cut into the top of the well casing, will be surveyed relative to the surrounding site wells and the nearest benchmark. Future depth to groundwater measurements will be made from the wellhead reference point. Additional monitoring well installation procedures that will be followed are included in Appendix B.

4.4 Groundwater Monitoring and Sampling

Fluid level measurements and groundwater sampling will be conducted no sooner than 48 hours after development of the well. Fluid levels will be measured relative to the top of the casing with a precision of 0.01 feet. The presence and thickness of free phase product will also be checked in the well.

After measuring fluid levels, the wells will be purged and sampled. A groundwater sample will be collected from the well using a disposable bailer following standard sampling procedures (Appendix B). The groundwater samples will be appropriately preserved and submitted to a State-certified laboratory for analysis. Chain-of-Custody protocol will be followed, providing a continuous record of sample possession before analysis. The laboratory will analyze the groundwater samples for the following:

- Total purgeable petroleum hydrocarbons (TPPH) by EPA Method 8260B
- BTEX by Method 8260B
- MTBE, TBA, DIPE, TAME, ETBE, 1,2-DCA, EDB, by EPA Method 8260B.

4.5 Waste Disposal

Soil cuttings and water generated during site assessment activities will be stored onsite in Department of Transportation (DOT)-approved 55-gallon drums pending disposal to an approved disposal/recycling facility. Waste manifests will be prepared for proper transport and disposal of the waste.

4.6 Site Assessment Report

Upon completion of the site assessment activities, a final report will be prepared which will include boring logs, well construction details, laboratory analytical results, findings, and conclusions. The report will be submitted to the ACEHS within six weeks of the completion of the field activities.

5.0 WORK SCHEDULE

Planned activities will be performed according to the following estimated completion schedule:

- Agency approval of workplan expected within four weeks of submittal.
- Conduct site assessment field activities within six weeks of agency approval of the work plan.
- Submit technical report within six weeks of completion of field activities.

6.0 REFERENCES

Gettler-Ryan Inc., 2001, Site Information Summary and Request For Closure for 76 Service Station No. 4625, 3070 Fruitvale Avenue, Oakland, California. August 21, 2001.

Gettler-Ryan Inc., 2003, Work Plan for Limited Subsurface Investigation, 76 Service Station No. 4625, 3070 Fruitvale Avenue, Oakland, California. July 23, 2003.

Helley, E. J. and K. R. Lajoie, 1979, Flatland Deposits of the San Francisco Bay Region, California - Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning: U.S. Geological Survey Professional Paper 943.

7.0 LIST OF ATTACHMENTS

Figure 1: Vicinity Map
Figure 2: Site Plan Showing Proposed Well Locations
Figure 3: Historical Groundwater Flow Directions
Appendix A: Site Health and Safety Plan
Appendix B: General Field Procedures

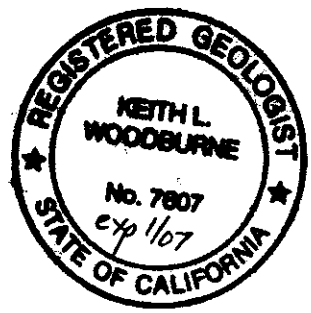
If you have any questions regarding this work plan, please call Roger Batra at (925) 688-2466.

Sincerely,
TRC

Andrew Fowler
Staff Geologist

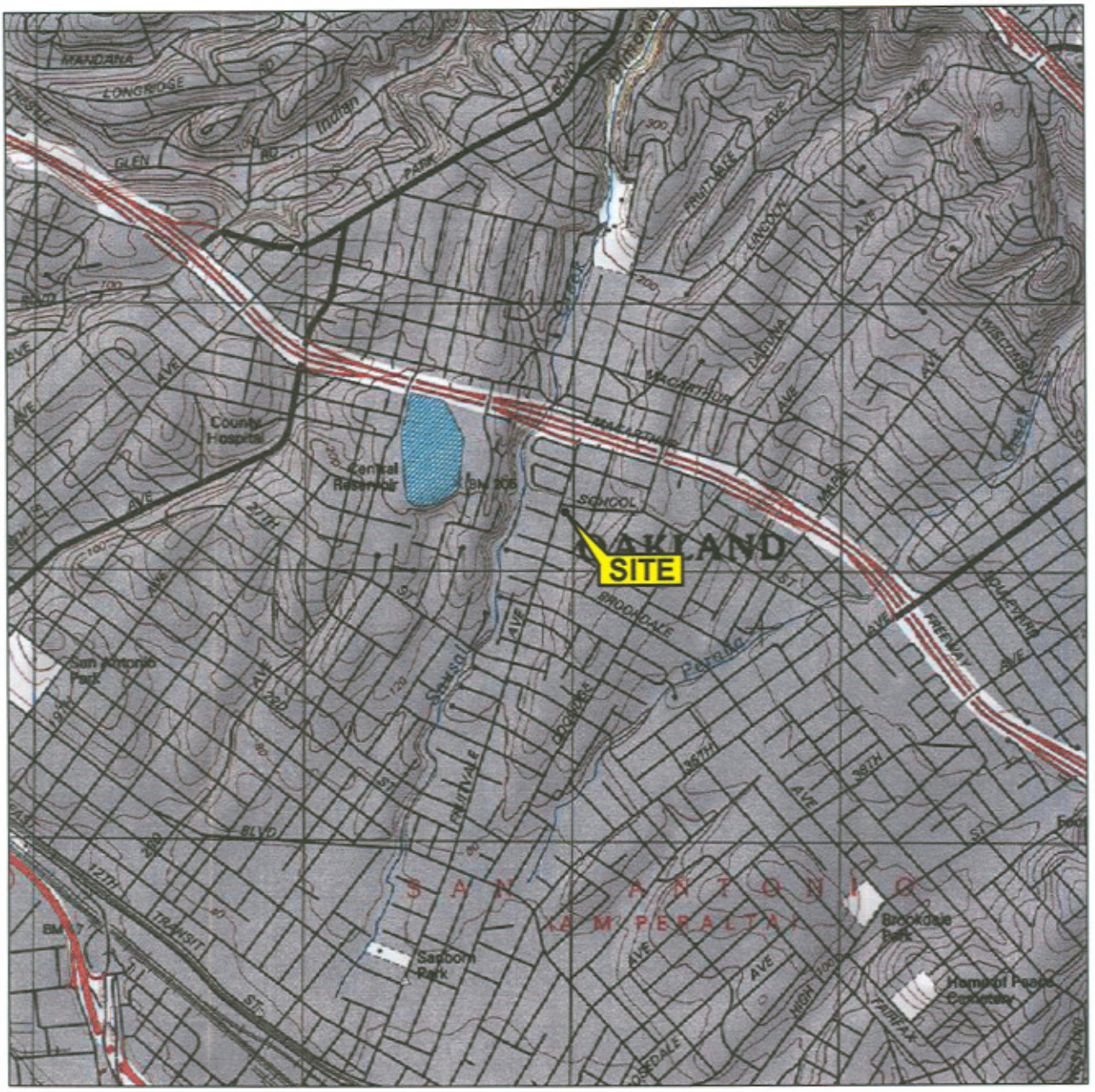
Keith Woodburne, R.G.
Senior Project Geologist

Roger Batra
Senior Project Manager



cc: Shelby Lathrop, ConocoPhillips

FIGURES



SOURCE:

United States Geological Survey
7.5 Minute Topographic Maps:
Oakland East Quadrangle
California

VICINITY MAP

76 Service Station #4625
3070 Fruitvale Avenue
Oakland, California

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FIGURE 1

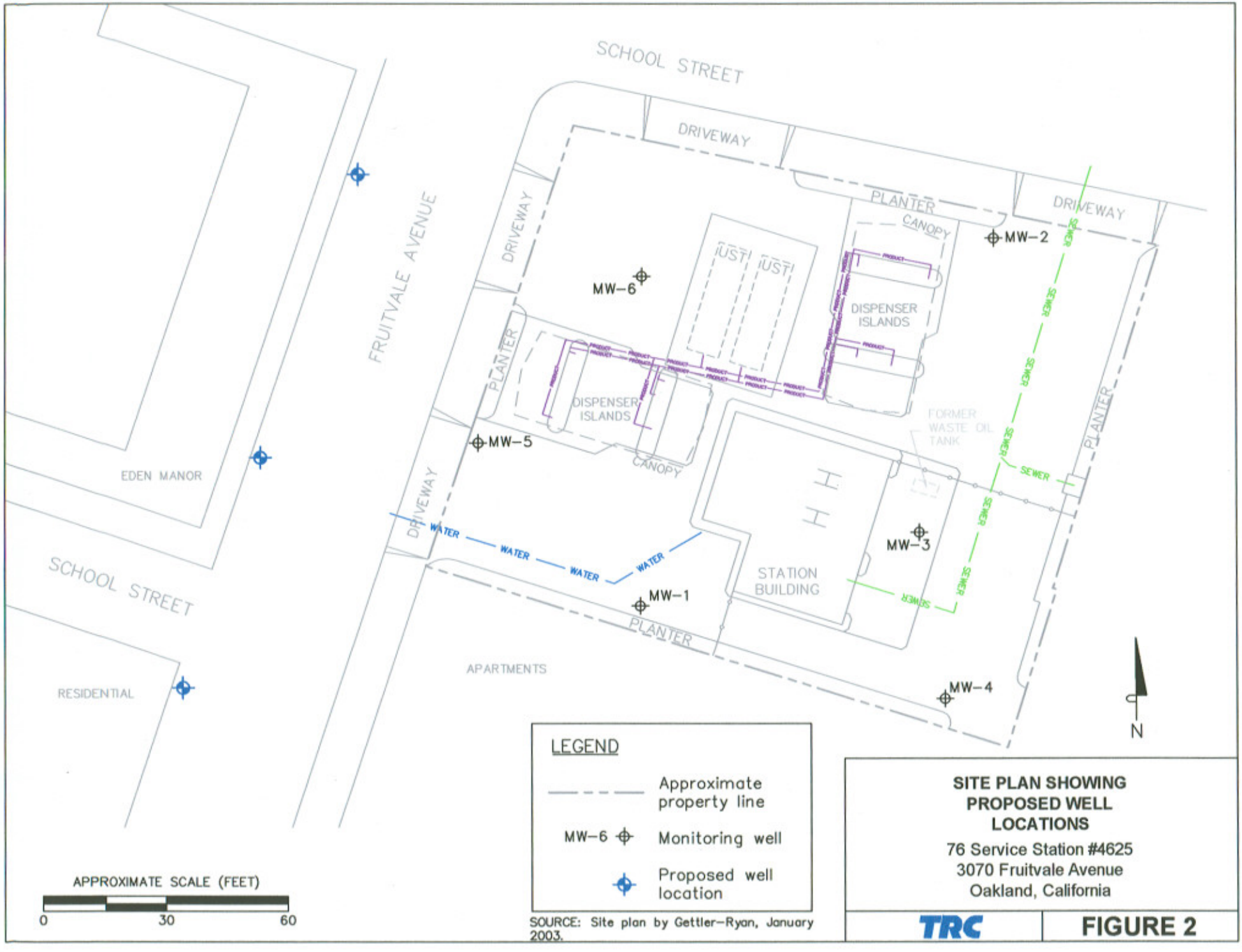
SCHOOL STREET
DRIVEWAY
PLANTER
CANOPY
DRIVEWAY
MW-2
DRIVEWAY
FRUITVALE AVENUE
MW-6
UST
UST
DISPENSER ISLANDS
PLANTER
DISPENSER ISLANDS
MW-5
CANOPY
FORMER WASTE OIL TANK
PLANTER
SEWER
EDEN MANOR
DRIVEWAY
WATER
WATER
WATER
WATER
MW-3
SCHOOL STREET
MW-1
STATION BUILDING
PLANTER
APARTMENTS
MW-4
RESIDENTIAL
N
LEGEND
Approximate property line
MW-6 Monitoring well
Proposed well location
APPROXIMATE SCALE (FEET)
0
30
60
SOURCE: Site plan by Gettler-Ryan, January 2003.
SITE PLAN SHOWING PROPOSED WELL LOCATIONS
76 Service Station #4625
3070 Fruitvale Avenue
Oakland, California
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FIGURE 2

Historical Groundwater Flow Directions for 76 Service Station No. 4625

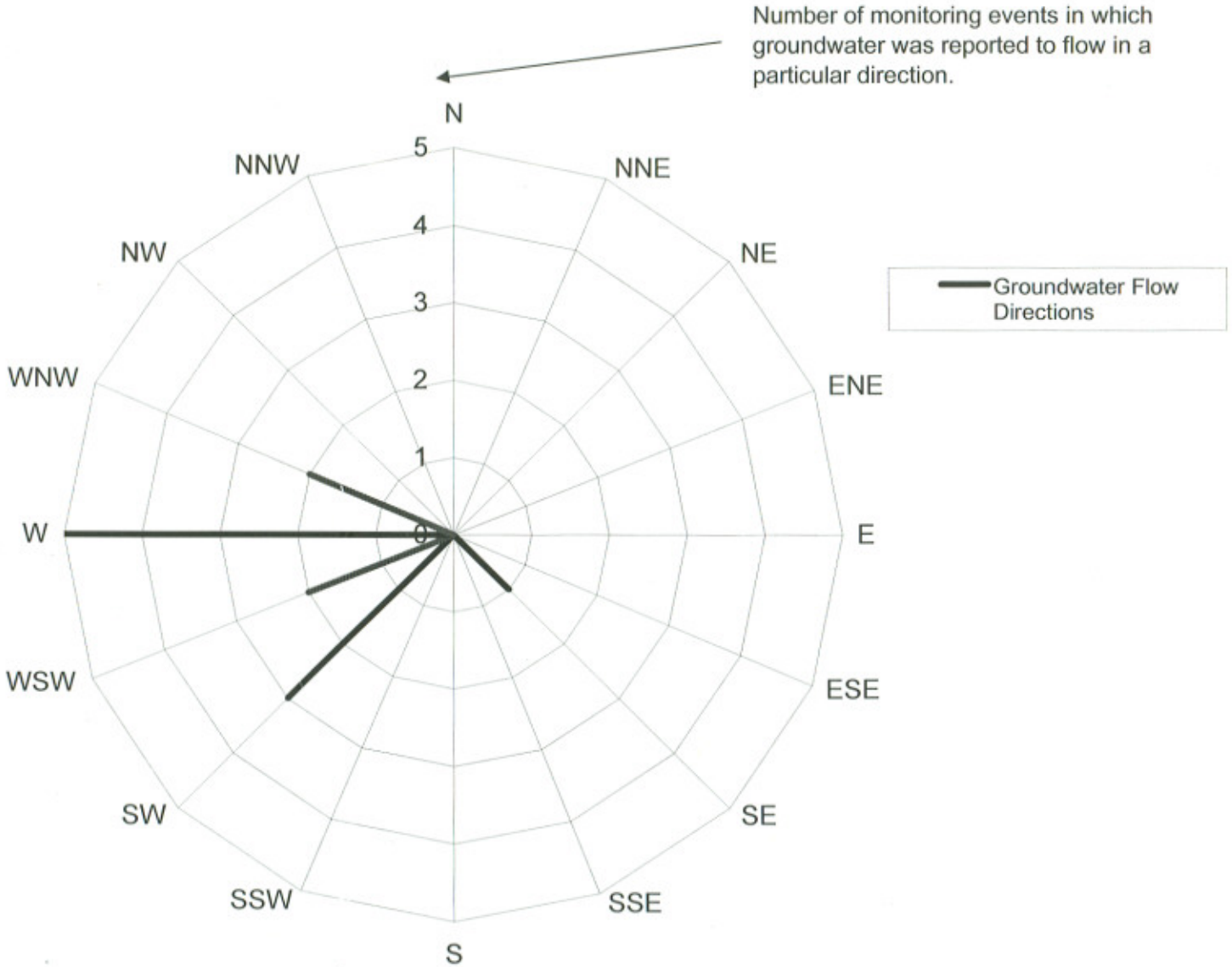

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FIGURE 3

APPENDIX A

Site Health and Safety Plan

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SITE HEALTH AND SAFETY PLAN

For
Monitoring Well Installation
ConocoPhillips Station No. 4625
3070 Fruitvale Avenue, Oakland, California

1.0 PLAN SUMMARY

This Site Health and Safety Plan (SHSP) will establish responsibilities, requirements, and procedures for the protection of personnel while performing activities at the above-referenced site. This site-specific plan conforms to the TRC Corporate Health and Safety Plan, Hazard Communication Program, and Injury and Illness Prevention Program (IIPP).

During site work, the use of proper health and safety procedures, in accordance with applicable Cal/OSHA regulations shall be required. Site-specific conditions may necessitate modification of the SHSP; however, except in emergency situations no deviations from the plan may be implemented without the prior notification and approval of the Site Safety Officer (SSO).

2.0 SITE INFORMATION

This SHSP considers the physical, chemical, and environmental hazards that may be encountered during work activities at the site. Operations associated with this SHSP will be conducted in accordance with an approved workplan. Any changes required or made to the planned activities will be immediately communicated to site personnel by the SSO. Summary information for this project is provided in the following table.

Workplan dated:	May 20, 2005
Principal activities:	Monitoring Well Installation
Site description (see Attachment A for site map):	Active automobile service station
Approximate depth to groundwater:	5-10 feet
Contaminants of concern (see Attachment B):	Fuel Hydrocarbons

3.0 SITE SAFETY AUTHORITY

Contact information and names of authorized personnel are listed below. A description of responsibilities follows.

Role	Name	Company	Telephone
Site Safety Officer	Andrew Fowler	TRC	(925) 688-2489
Project Manager	Roger Batra	TRC	(925) 688-2466
Local IIPP Coordinator	Kristen Meade	TRC	(925) 688-2481
Client Contact	Shelby Lathrop	ConocoPhillips	(916) 558-7609

Site Safety Officer: The SSO is responsible for briefing site personnel on potential physical and chemical hazards prior to work start-up, during operations, and whenever other health and safety matters need to be addressed. The SSO will be in charge of conducting the daily Tailgate Safety Meetings. The SSO will see that this SHSP is available onsite and is understood and signed by personnel entering the site. The SSO is also responsible for implementing emergency response procedures when necessary. In the event the SSO is unable to perform these duties, the Alternate SSO will be responsible.

Project Manager: The Project Manager (PM), in coordination with the SSO, is responsible for implementing health and safety requirements, including seeing that the SHSP is prepared and available onsite. The PM is the central point of contact for the SSO, Client, and Field Personnel, and has overall responsibility for site operations.

Field Personnel: Field Personnel are responsible for understanding and complying with this SHSP. Field Personnel include both TRC employees and Subcontractors hired by TRC. Field Personnel are required to participate in briefings prior to commencement of site work; attend daily Tailgate Safety Meetings; and acknowledge receipt and understanding of the SHSP by signing the Compliance Log at the end of this plan.

4.0 SITE CONTROL

Site control requires the establishment of a regulated area with designated work zones, evacuation protocol, location of medical assistance, site security, and communication guidelines that include a "Buddy System."

4.1 REGULATED AREA(S)

Each site will have an established Exclusion Zone with controlled access, and a Support Zone. Supervision and strict control of access to regulated areas is necessary to protect site personnel as well as the public.

Exclusion Zone: (*a.k.a. "Hot Zone"*) This is the area where personnel may be subject to chemical or physical hazards. It is the zone of known or suspected contamination, where equipment operation and/or environmental sampling will take place. The Exclusion Zone is to be clearly identified and isolated with cones, barricades, or high visibility caution tape. Personnel working in the Exclusion Zone will at a minimum use Level D personal protective equipment as described in **Section 7.0.**

The outer boundary of the Exclusion Zone *("Hot Line")* will be established by the SSO, so that sufficient area is available to conduct operations while providing a protective buffer for persons and property outside the zone.

Support Zone: *(a.k.a. "Safe Zone")* This is the area outside the Exclusion Zone where administrative and other support functions are located. Adverse exposure to contaminants and physical hazards are unlikely in the Support Zone.

4.2 EVACUATION PROTOCOL

Evacuation protocol and routes from the site will be established by the SSO, and communicated to Field Personnel during the Tailgate Safety Meeting(s) prior to initiating work. Evacuation protocol will be implemented as needed in emergency situations. In the event of an evacuation, personnel will meet at a pre-established location and the SSO will do a "head count" to see that everyone has left the hazard area.

Emergency Response procedures are outlined in **Section 12.0.** Directions to the nearest medical facilities are provided in **ATTACHMENT C.**

4.3 SITE SECURITY

Appropriate security measures will be established in coordination with the site owner/operator and communicated to site personnel. The objective of these measures is to (1) protect the public from potential exposure to physical/chemical hazards; (2) avoid public interference with personnel and safe work practices; and (3) prevent theft or vandalism of equipment at the site.

4.4 COMMUNICATION

Communication is an important aspect of the site control program as well as the entire SHSP. Personnel should keep in mind that hazard assessment is a continuous process, and any potentially unsafe condition must be reported immediately to the SSO.

Onsite personnel will use the "Buddy System" and maintain communication or visual contact between team members during site operations. The Buddy System is used to provide assistance, monitor for chemical exposure and heat stress, and obtain emergency assistance for coworkers when necessary. Site personnel will be familiar with the following emergency hand signals:

Hand gripping throat:	Can't breathe. Respirator problems.
Grip team member's wrist or both hands on team member's waist:	Leave site immediately, no debate!
Thumbs up:	Yes. I'm all right. I understand.
Thumbs down:	No. Negative.

5.0 HAZARD ASSESSMENT

Hazard assessment is essential for establishing hazard reduction measures. Hazard assessment will consist primarily of site inspections and monitoring. Known operational hazards (heavy equipment, overhead lines, etc.) and site characterization data (contaminant location, concentration, etc.) are also considered in the assessment. The following is a list of potential hazards associated with the activities planned for this site:

Physical Hazards	Drilling equipment Tripping, slipping, and falling Head, foot, eye, and back injuries Sharp objects
Chemical Hazards	Gasoline / benzene, toluene, ethylbenzene, xylenes (BTEX), MTBE
Environmental Hazards	Noise exposure Weather - heat, cold, rain, fog Biological - plants, animals/insects, pathogens

Walk-though safety inspections will be conducted by the SSO daily and as conditions change. Inspection results will be communicated to the work crews during the morning Tailgate Safety Meetings and as needed.

6.0 HAZARD REDUCTION

Personnel are required to exercise reasonable caution at all times during work activities. Failure to follow safety protocols and/or continued negligence of health and safety policies will result in expulsion of a crewmember from the site and may result in termination of employment. In general, the potential for hazardous situations will be reduced by the following activities:

Implementing engineering controls

Using personal protective equipment

Performing air monitoring

Engineering Controls, corresponding to the hazard assessment for work at this site, are outlined below in **Sections 6.1 through 6.4**. Personal protective equipment (PPE) and air monitoring guidelines are outlined in **Sections 7.0 and 8.0**, respectively.

6.1 PHYSICAL HAZARDS AND CONTROLS

Drilling Equipment

The operation and use of drilling equipment presents the greatest potential for injury to personnel. To minimize these hazards, designated routes and specific traffic patterns will be established. Trucks will use spotters for backing. If personnel need to approach drilling equipment during operation, they will observe the following protocols: make eye contact with the operator, and then approach the equipment to inform operator of intentions.

Only equipment that is in safe working order will be used. Only qualified personnel will be allowed to operate drilling equipment. Subcontractors will supply proof of qualifications to operate the equipment. Those crewmembers directly involved in spotting for the operator will be the only personnel allowed within the operating radius of the drilling equipment. Other personnel will remain at a safe distance from these operations.

Explosion and Fire

Liquid petroleum products readily vaporize from standing pools or saturated soil. Ignition sources pose an explosion and fire hazard (e.g., engines, impact sparking, and heat or arc from inappropriate equipment or instrumentation). A direct-reading combustible gas indicator (CGI) will be used to

evaluate the possible formation of flammable atmospheres in and around the work area. **See Section 8.0: Air Monitoring.**

Emergency services (911) are to be called immediately in case of a fire or explosion. A portable fire extinguisher will be kept onsite for use on small fires only. Only personnel trained in the proper use of fire extinguishers are authorized to use the onsite fire extinguisher.

Tripping, Slipping, and Falling

Personnel will be reminded daily to maintain sure footing on all surfaces. Use of safety harnesses is required for personnel working ***6 feet or more*** above any surface that does not have handrails (includes riding on manlifts). Work surfaces of unknown or suspect integrity will be strengthened or overlaid with a work platform capable of supporting personnel and equipment working in the area. To minimize tripping hazards caused by construction and other debris, material will be removed daily from the work areas and stockpiled in appropriate designated storage areas. This "housekeeping" effort will be enforced by the SSO at the end of each day.

Head, Foot, Eye, and Back Injuries

Hard hats, steel toe boots, and safety glasses will be worn during site operations. To avoid back injuries, personnel will be trained in and required to use proper equipment and lifting techniques for manual material handling.

Sharp Objects

Nails, wires, saws, and cutting equipment pose potential hazards such as cuts and punctures during site work. *Only appropriate work tools are to be used.* Personnel are required to exercise caution, and should wear leather work gloves when handling or operating cutting tools, saws, and other sharp objects. A consistent housekeeping effort at the site will also help to reduce hazards from sharp objects.

6.2 CHEMICAL HAZARDS AND CONTROLS

Chemical Characteristics

Hazardous chemicals that may be encountered at this site include gasoline, diesel, stove oil, and hydraulic oil hydrocarbons. These chemicals may be volatile, flammable, moderately to extremely toxic, or carcinogenic when inhaled, ingested, or absorbed above certain concentrations. See **ATTACHMENT B** for specific exposure limits and basic toxicology information.

Personnel will use engineering controls and PPE (based on hazard assessment) to prevent chemical exposure.

Sample Collection

Workers who must come in direct contact with known or suspected contaminated soil or groundwater to collect samples are required to wear protective gloves and other PPE, as needed, to reduce the potential for exposure. Safety glasses will be worn to avoid potential splashing of chemicals into the eyes.

Soil Cuttings, Decontamination Water, and Dust

As with sample collection, precautions are to be followed for handling materials such as soil cuttings and cleaning/decontamination water. Exposure and potential inhalation of dust (nuisance, silica) will be minimized by wearing dust masks or other appropriate PPE/respiratory protection.

Disposition of Materials

Excavated soil will be stockpiled and covered, or stored in closed drums or roll-off bins. Purged water will be stored in closed drums or tanks. Drums, tanks, and/or roll-off bins containing soil or water will be labeled in accordance with the hazard communication standard and removed from the site in accordance with client-approved protocol.

Hygiene

Eating, smoking, and drinking are NOT ALLOWED in the work area. Site personnel will wash their hands, arms, and faces thoroughly prior to eating or drinking, and at the end of their shift. Food should never be stored where it may come into contact with, or be contaminated by, petroleum products, pesticides, or other toxic materials.

6.3 ENVIRONMENTAL HAZARDS AND CONTROLS

Noise Exposure

Hearing protection (earplugs or earmuffs) will be worn when project personnel enter high-noise areas. The SSO should see that extra earplugs are available onsite.

Heat Stress

Heat stress may be caused by the combination of ambient factors such as high air temperature, high relative humidity, and low air movement. This condition can result in heat rash, heat cramps, heat exhaustion, and/or heat stroke. It can impair worker coordination and judgement and directly impact health and safety. Heat stress is more likely when PPE is worn. Personnel are to drink plenty of water and take breaks (in shaded rest areas) as needed to help prevent heat stress. As part of the Buddy System, personnel should watch for signs and symptoms of heat stress in coworkers as well as themselves.

Cold Exposure

To guard against cold injury (frostbite and hypothermia), which is a danger when the temperature and wind-chill factor are low, employees will wear appropriate clothing, have warm shelter readily available, and maintain carefully scheduled work and rest periods.

Biological Hazards

Personnel will assess their surroundings for potential biological hazards, which may be posed by poisonous plants, insects, animals, and indigenous pathogens. Protective clothing and respiratory equipment can help reduce the chances of exposure. Thorough washing of any exposed body parts and equipment will help protect against infection from biological hazards. ***"Universal Precautions"*** (e.g., wearing latex gloves) must be taken any time there is potential for exposure to human blood, such as when an employee renders first aid to a coworker.

6.4 CONFINED SPACE HAZARDS

Confined space entry is NOT ANTICIPATED during the course of these operations. However, if such a situation is encountered, workers are prohibited from entering confined spaces until the company plan dealing with confined spaces has been implemented.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 LEVEL OF PROTECTION

Personnel are required to wear PPE appropriate for the task and anticipated exposure to known contaminants. Selection of PPE will be based on hazard assessment, task performance, and air monitoring. Based on the history of this site, the initial level of protection will be Level D. At a minimum, Level D PPE will consist of the following:

- ☐ Hardhat
  at all times in work area
- ☐ Boots: chemical-resistant, steel toe and shank
  at all times in work area
- ☐ Safety glasses, splash goggles, or hardhat with face shield
  when there is risk of hazardous substances (sampling) or flying particles (drilling, excavation, etc.) getting into eyes
- ☐ Ear plugs / hearing protection

when high-noise equipment/drill rig is in operation

- ☐ Gloves: chemical-resistant
  when handling soil cuttings or soil/water samples

Site personnel also are required to *be prepared* with the following items:

- ☐ Respirators: half-face, air-purifying with appropriate cartridges
- ☐ Dust masks
- ☐ Tyvek coveralls and other suitable protective clothing
- ☐ Traffic safety vest
- ☐ Leather work gloves and back brace/lifting belt

Air monitoring information will dictate when and if a site will be upgraded to Modified Level D (Level D plus respirator).

7.2 RESPIRATOR SELECTION

For operations that require the use of a respirator, the SSO must verify that Field Personnel are medically approved to use respiratory equipment, fit tested, and trained in the proper use of air-purifying respirators. Site personnel are required have their respirator available and ready to use onsite. Only respirators that are NIOSH/MSHA approved are to be used.

Air monitoring will be performed to assess airborne contaminant levels onsite, and to evaluate suitable respiratory protection. Workers will be required to wear half-face, air-purifying respirators with organic vapor cartridges under the following circumstances, as indicated by onsite air monitoring:

- ☐ If volatile organic compound (VOC) vapors in the work area continuously exceed the threshold limit value - time-weighted average (TLV-TWA) for gasoline (300 parts per million [ppm]).

- ☐ If, at any time, VOC vapors in the work area exceed the threshold limit value - short-term exposure limit (TLV-STEL) for gasoline (500 ppm).

TLV values for gasoline are derived from American Conference of Governmental Industrial Hygienists (ACGIH) standards. Similar precautions will be taken with regard to other toxic chemicals, such as BTEX components. See **ATTACHMENT B** for additional information and regulatory exposure limits.

7.3 REASSESSMENT OF PPE

The levels of protection listed above will be upgraded (or downgraded) based on changes in activities, changes in site conditions, measurements of direct-reading instruments (compared to action levels for contaminants), or other findings. Changes in the level of protection require the approval of the SSO.

8.0 AIR MONITORING

Monitoring will be conducted as needed to characterize airborne contaminant levels. The potential hazards associated with the presence of hydrocarbons include (1) personnel exposure to chemicals, and (2) possible formation of flammable atmospheres in and around the work area. Air sampling will be conducted in accordance with NIOSH, OSHA, or EPA methods. The SSO will check to see that air-monitoring equipment brought onsite is properly calibrated prior to operation and recalibrated during the course of the day, as necessary.

8.1 FLAME IONIZATION DETECTOR

A flame ionization detector (FID) will be used for the monitoring of VOCs in the work area in accordance with the requirements outlined in Title 8 CCR 5192. Air monitoring will be conducted in the breathing zone of workers, and the data collected will be used to evaluate suitable respiratory protection against chemicals encountered. Refer to the Respirator Selection guidelines in **Section 7.2** for personal protection measures. Measurements will also be obtained periodically at the top of boreholes or excavation cavities, and during any construction activities in which hydrocarbon-affected soil is encountered; however, only breathing zone measurements will be used to determine whether PPE should be used or discontinued.

8.2 COMBUSTIBLE GAS INDICATOR

A direct-reading, portable CGI that measures VOC concentrations in ppm, or as a percentage of the lower explosive limit (LEL), will be used to monitor airborne concentrations of VOCs and evaluate the possible formation of flammable atmospheres in and around the work area. Data will be used to monitor and evaluate vapor concentrations within or emanating from well bores, excavations, and contaminated soil that is stockpiled, moved, or loaded on or about the site. Measurements will be obtained periodically at the top of boreholes or excavation cavities throughout drilling or excavation operations, and during any construction activities in which hydrocarbon-affected soil is encountered. Periodic measurements also will be taken in areas that may contain an accumulation of combustible vapors.

In the event that CGI readings on the site exceed 10 percent of the LEL, work will be suspended, monitoring will be continued as needed to isolate the area of concern, and the following applicable environmental controls will be implemented:

1. Vapors from pooled petroleum product will be suppressed (if necessary) by spraying with foam, appropriate chemical suppressant, or carbon dioxide in gas form or dry ice.

2. Air movers will be used to ventilate the areas of concentration to below 10 percent LEL.

3. Contaminated soil will be covered with clean soil and/or sprayed with water or deodorizing chemicals in order to reduce vaporization of VOCs.

9.0 DECONTAMINATION

Due to the expected low levels and types of contaminants at the site, it is anticipated that personnel will not perform routine decontamination procedures when leaving the Exclusion Zone. Project activities will be initially conducted in Level D PPE. When decontamination is necessary, it will consist of the following:

- Removal of contaminated garments in an "inside out" manner at a designated decontamination station located at the step-off location where personnel routinely enter/exit the Exclusion Zone.

- Placement of contaminated garments in designated plastic bags or drums prior to disposal or transfer offsite. Labels in compliance with the hazard communication standard will be affixed to containers of contaminated debris and clothing.

10.0 PERSONNEL TRAINING

Personnel who will perform field activities shall meet the training requirements specified in the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard [29 CFR 1910.120 (e)]. Prior to commencement of work, the SSO will discuss the potential physical and chemical hazards associated with site operations, and review safe work practices with personnel. Personnel are required to acknowledge their understanding and willingness to comply with this SHSP before admission to the site by signing the Compliance Log at the end of the SHSP.

Other job-specific training required to perform tasks within this operation will be verified by the SSO. This training may include, but is not be limited to respirator fit testing, safe lifting techniques, confined spaces, hearing conservation, and proper fire fighting procedures.

11.0 MEDICAL PROGRAM

The site medical program has two main components: a baseline medical surveillance program, and emergency medical assistance procedures.

11.1 BASELINE MEDICAL SURVEILLANCE

TRC has established a medical surveillance program to assess, monitor, and help protect the health of employees, in particular, employees who may be exposed to potentially hazardous substances during site work. Personnel will undergo medical examinations as follows:

Initial: Pre-employment / prior to any assignment involving work in a hazardous or potentially hazardous environment. The initial examination is used to establish a baseline picture of health against which future changes can be measured, and to identify any underlying illnesses or conditions that might be aggravated by chemical exposures or job activities.

Periodic: At least once every 12 months to measure changes in health status.

Upon notification: As soon as possible upon notification by an employee that they have developed signs or symptoms indicating possible overexposure to hazardous substances, or in response to an injury or exposure during an emergency situation.

Exit: At termination of employment.

11.2 EMERGENCY MEDICAL ASSISTANCE

An emergency medical assistance network will be established prior to work start-up. The nearest fire department, police, ambulance service, and hospital with an *emergency room* will be identified. **See ATTACHMENT C** for Emergency Services contact information. A vehicle shall be available onsite during work activities to transport injured personnel to the identified emergency medical facilities, if necessary. Company vehicles are to be equipped with a fire extinguisher and first aid kit.

12.0 EMERGENCY RESPONSE PLAN

The SSO will have controlling authority during an emergency. In the SSO's absence, the Alternate SSO will be in charge. See ATTACHMENT C for the name, location, and telephone number of emergency response organizations in the vicinity of the project site, and a map to the nearest hospital(s).

12.1 EMERGENCY PROCEDURES

In the event of an accident, injury, or other emergency, remember to:

Stop work and REMAIN CALM.

Move personnel to a safe location (evacuation plan).

Call 911 or notify other emergency facilities.

Address medical emergencies and apply first aid, if necessary.

Contain physical hazards. (NOTE: Act only if hazard is minimal and you are trained to deal with the situation. Otherwise evacuate and wait for emergency services to arrive.)

Notify offsite supervisor and client, and initiate accident-reporting procedures.

12.2 ACCIDENT REPORTING

In case of an accident, the SSO (or Alternate) will immediately notify the Supervisor/Offsite Coordinator at the nearest TRC office and later provide a report to the PM describing the following:

1. A description of the event (including date and time) that required notification of offsite personnel (i.e., medical facilities, fire department, police department) and the basis for that decision.

2. Date, time, and names of persons/agencies notified, and their response.

3. Details regarding personal injury and property damage, if any.

4. Resolution of incident and the corrective action involved.

All incidents and near misses are to be investigated in accordance with TRC's IIPP. The Supervisor's Report of Accident is to be completed and submitted to the Human Resources department within 24 hours following any accident or injury.

SITE HEALTH AND SAFETY PLAN
COMPLIANCE LOG

I have reviewed this Site Health and Safety Plan and understand the contents of the plan. I hereby agree to comply with all safety requirements outlined herein.

Signature: _____ Date:
Site Safety Officer, TRC, Inc.

Signature: _____ Date:
Alternate Safety Officer, TRC, Inc.

Signature: _____ Date:
Print Name:
Company:

Signature: _____ Date:
Print Name:
Company:

Signature: _____ Date:
Print Name:
Company:

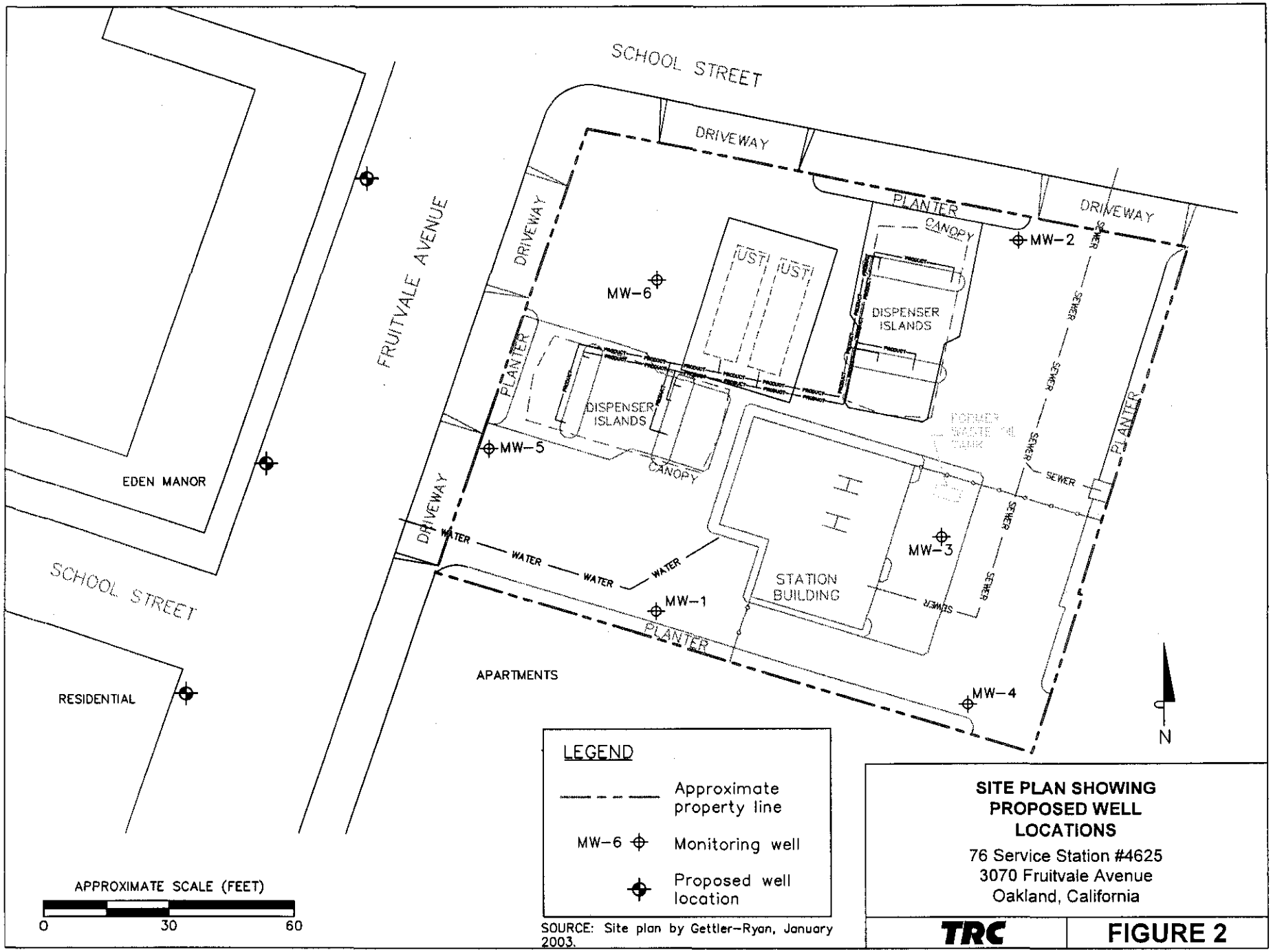
Signature: _____ Date:
Print Name:
Company:

Signature: _____ Date:
Print Name:
Company:

Signature: _____ Date:
Print Name:
Company:

ATTACHMENT A

SITE PLAN


SCHOOL STREET
DRIVEWAY
PLANTER
CANOPY
DRIVEWAY
MW-2
FRUITVALE AVENUE
DRIVEWAY
MW-6
USTI
USTI
DISPENSER ISLANDS
PLANTER
DISPENSER ISLANDS
MW-5
CANOPY
SEWER
SEWER
SEWER
PLANTER
EDEN MANOR
DRIVEWAY
WATER
WATER
WATER
WATER
MW-3
STATION BUILDING
SEWER
SEWER
SCHOOL STREET
MW-1
PLANTER
APARTMENTS
MW-4
RESIDENTIAL
N
LEGEND
Approximate property line
MW-6
Monitoring well
Proposed well location
APPROXIMATE SCALE (FEET)
0
30
60
SOURCE: Site plan by Gettler-Ryan, January 2003.
SITE PLAN SHOWING PROPOSED WELL LOCATIONS
76 Service Station #4625
3070 Fruitvale Avenue
Oakland, California
TRC
FIGURE 2

ATTACHMENT B

OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

Gasoline Constituents

Contaminant	ACGIH TLV-TWA (ppm)	NIOSH REL (ppm)	OSHA PEL (ppm)	STEL (ppm)	IDLH (ppm)	Routes of Exposure	Known or Suspected Carcinogen	Symptoms
Diesel (as Stoddard solvent)	for Diesel fuel/ Kerosene 14.4 (skin only)	Approx. 60-98	500	250-500 (NIOSH ceiling)	Approx. 3000-5600	Inhalation, Ingestion, Contact	No	Irritation to eyes, skin, mucous membrane; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, aspiration, weakness, restlessness, incoordination
Gasoline	300	n/a	n/a	500 (ACGIH)	n/a	Inhalation, Absorption, Ingestion, Contact	Yes	Irritation to eyes, skin, mucous membrane; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, aspiration
Benzene	0.5	0.1	1	1 (NIOSH)	500	Inhalation, Absorption, Ingestion, Contact	Yes	Irritation to eyes, skin, nose, resp system, giddiness, headache, nausea, staggered gait, fatigue, anorexia, weakness/exhaustion, dermatitis
Toluene	50	100	200	150 (NIOSH)	500	Inhalation, Absorption, Ingestion, Contact	No	Irritation to eyes, nose; fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, tears, nervousness, muscle fatigue, insomnia, dermatitis
Ethylbenzene	100	100	100	125 (NIOSH& ACGIH)	800	Inhalation, Ingestion, Contact	No	Irritation to eyes, skin, mucous membranes; headache, dermatitis, narcosis, coma
Xylenes (o,m,p,)	100	100	100	150 (NIOSH & ACGIH)	900	Inhalation, Absorption, Ingestion, Contact	No	Irritation to eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination,staggering gait, nausea, vomiting, abdominal pain, dermatitis
Methyl tert butyl ether (MTBE)	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a

DEFINITIONS

ACGIH TLV-TWA	American Conference of Governmental Industrial Hygienists, Threshold Limit Value-Time Weighted Average
NIOSH REL	National Institute of Occupational Safety & Health, Recommended Exposure Limit
STEL	Short Term Exposure Limit (Gasoline STEL is by ACGIH; BTEX STELs are by NIOSH)
OSHA PEL	Occupational Safety and Health Administration, Permissible Exposure Limit
IDLH	Immediately Dangerous to Life and Health
ppm	parts per million
CNS	Central Nervous System
n/a	not available (i.e., no value has been established)

Threshold Limit Value: Threshold limit values (TLVs) refer to airborne concentrations of substances and represent conditions under which it is believed nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

Threshold Limit Value - Time Weighted Average: The time weighted average (TWA) is a concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. TLV-TWAs are established by the ACGIH.

Recommended Exposure Limit: Unless otherwise noted, the recommended exposure limit (REL) is a TWA concentration for up to a 10-hour workday during a 40-hour workweek. RELs are established by NIOSH to reduce or eliminate adverse occupational health effects.

Short Term Exposure Limit: A short-term exposure limit (STEL) is defined as a 15-minute TWA exposure that should not be exceeded at any time during a workday. When compared to the REL (or TLV-TWA for ACGIH standards), the STEL allows the worker to be exposed to a higher concentration, BUT for a shorter period of time. Exposures above the REL up to the STEL should not be longer than 15 minutes and should not occur more than four times per day.

Permissible Exposure Limit: Permissible exposure limits (PELs) are TWA concentrations that must not be exceeded during any 8-hour work shift of a 40-hour workweek. PELs are established by OSHA (29 CFR 1910.1000).

Immediately Dangerous to Life and Health: Immediately dangerous to life and health (IDLH) values are established as concentrations from which a worker can escape within 30 minutes without suffering loss of life, irreversible health effects, or other deleterious effects that could prevent him/her from escaping the hazardous environment. The purpose of establishing an IDLH exposure concentration is to ensure that workers can escape from a given contaminated environment in the event of failure of respiratory protection equipment.

ATTACHMENT C

EMERGENCY SERVICES
PHONE NUMBERS, DIRECTIONS, AND LOCAL AREA MAP

EMERGENCY SERVICES

FACILITY / LOCATION	TELEPHONE
Emergency Situation	**911**

Medical Facility ***(with Emergency Room)***

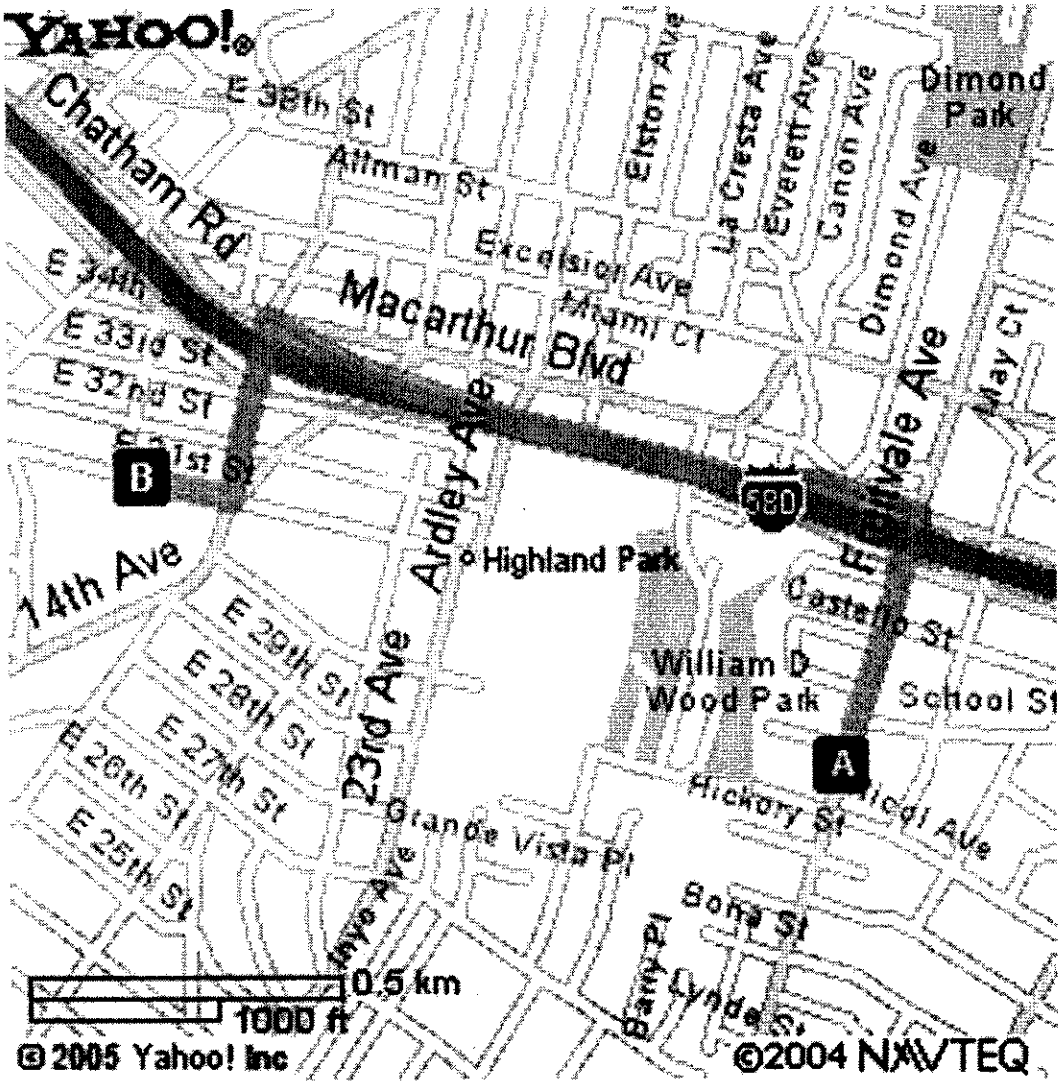
Alameda County Medical Center Highland 1411 East 31st Street, Oakland, California	510-534-8055

Directions

1. Start at **3070 FRUITVALE AVE, OAKLAND** going toward **SCHOOL ST** - go **0.3** mi
2. Turn (L) onto **I-580 WEST** toward **HAYWARD** - go **0.4** mi
3. Take the **14TH AVENUE/PARK BLVD** exit toward **BEAUMONT AVE** - go **0.3** mi
4. Turn (L) on **BEAUMONT AVE** - go **0.2** mi
5. Turn (R) on **E 31ST ST** - go **0.1** mi
6. Arrive at **ALAMEDA COUNTY MED CENTER-HIGHLAND**

Fire Department:	911
Police Department:	911
Poison Control Center:	
Poison Center - Regional (24-hour)	(800) 523-2222
Office of Emergency Services:	(800) 852-7550
USA North:	(800) 227-2600

LOCAL AREA MAP
with route to hospital


YAHOO!
E 35th St
Chatham Rd
Altman St
Elston Ave
La Cresta Ave
Everett Ave
Canon Ave
Dimond Park
Dimond Ave
May Ct
Excelsior Ave
Miami Ct
E 34th
E 33rd St
Macarthur Blvd
E 32nd St
E 31st St
B
Ardley Ave
580
Fairfax Ave
14th Ave
Highland Park
Castello St
E 29th St
E 28th St
E 27th St
E 26th St
E 25th St
23rd Ave
William D
Wood Park
School St
A
Hickory St
Grande Vista Pl
Bond St
Lynde St
0.5 km
1000 ft
©2005 Yahoo! Inc
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TAILGATE SAFETY MEETING CHECKLIST

Topics Covered
(Check off as discussed)

____ **Personnel training/qualifications:** Check cards for OSHA HAZWOPER 40-hour certification/8-hour-refresher training (other if appropriate).

____ **Supplies:** Indicate location of first aid kit, fire extinguisher, clean water supply (drinking, eye wash), and Site Health and Safety Plan (SHSP).

____ **Emergency services:** Discuss location of nearest telephone and directions to hospital. Map, directions, phone numbers provided at end of SHSP (Attachment C).

____ **Site background:** Discuss types, locations, and concentrations of chemicals found onsite, presence of free product, depth to groundwater, etc.

____ **Work activities:** Discuss scope of work for the day and activities to be performed.

____ **Potential hazards:** Discuss physical hazards (lifting, pinch points, traffic, working around machinery, etc.); chemical hazards (exposure limits, symptoms, air monitoring); and environmental hazards (heat stress, etc.).

____ **Air monitoring:** Necessary equipment is onsite and calibrated. Circle: CGI PID

____ **Personal protective equipment (PPE):** Discuss required level of protection. See that workers have appropriate PPE onsite; includes, but is not limited to, hardhat, steel-toe boots, safety glasses, ear plugs / hearing protection, respirator (with cartridges), gloves, traffic safety vest (other _____).

____ **Utilities:** Utilities have been cleared/marked by appropriate divisions.

____ **Traffic control** (vehicular and pedestrian): Work area is properly delineated and cordoned off from traffic.

____ **Compliance log:** SHSP has been reviewed and signed by site personnel.

APPENDIX B

General Field Procedures

GENERAL FIELD PROCEDURES

A description of the general field procedures used during site investigation and monitoring activities is presented below. For an overview of protocol, refer to the appropriate section(s).

DRILLING AND SOIL SAMPLING

Soil borings are drilled using continuous-flight, hollow-stem augers. Borings that are not completed as monitoring wells are grouted to within 5 feet of the ground surface with a cement/bentonite slurry. The remaining 5 feet is filled with concrete.

Soil samples are obtained for soil description, field hydrocarbon vapor screening, and possible laboratory analysis. Soil samples are retrieved from the borings by one of two methods: 1) continuously, using a 5-foot-long, continuous-core barrel sampler advanced into the soil with the lead auger; sample tubes are driven into the core with a mallet, or 2) at 2.5- or 5-foot intervals, using a standard split-spoon sampler lined with four 1.5-inch-diameter stainless steel or brass sample inserts. The split-spoon sampler is driven approximately 18 inches beyond the lead auger with a 140-pound hammer dropped from a height of 30 inches.

For hand auger borings and hand-held, power-driven auger borings, soil samples are retrieved using a hand-driven slide hammer lined with a 1.5-inch-diameter stainless steel sample tube.

During drilling activities, soil adjacent to the laboratory sample is screened for combustible vapors using a combustible gas indicator (CGI) or equivalent field instrument. For each hydrocarbon vapor-screening event, a 6-inch-long by 2.5-inch-diameter sample insert is filled approximately 1/3 full with the soil sample, capped at both ends, and shaken. The probe is then inserted through a small opening in the cap, and a reading is taken after approximately 15 seconds and recorded on the boring log. The remaining soil recovered is removed from the sample insert or sampler, and described in accordance with the Unified Soil Classification System. For each sampling interval, field estimates of soil type, density/consistency, moisture, color, and grading are recorded on the boring logs.

SOIL SAMPLE HANDLING

Upon retrieval, soil samples are immediately removed from the sampler, sealed with Teflon sheeting and polyurethane caps, and wrapped with tape. Each sample is labeled with the project number, boring/well number, sample depth, geologist's initials, and date of collection. After the samples have been labeled and documented in the chain of custody record, they are placed in a cooler with ice at approximately 4 degrees Celsius (°C) prior to and during transport to a state-certified laboratory for analysis. Samples not selected for immediate analysis may be transported in a cooler with ice and archived in a frostless refrigerator at approximately 4°C for possible future testing.

MONITORING WELL INSTALLATION

Monitoring wells are constructed of 4-inch-diameter, flush-threaded Schedule 40 PVC blank and screened (0.020-inch slot size) casing. Where possible, the screened interval will extend at least 10

feet above, and 10 to 20 feet below, the top of the groundwater table. The annular space surrounding the screened casing is backfilled with No. 3 Monterey sand (filter pack) to approximately 2 feet above the top of the screened section.

During well construction, the filter pack is completed by surging with a rig-mounted surge block. A 3-foot-thick bentonite annular seal is placed above the filter pack. The remaining annular space is grouted with Portland cement and/or bentonite grout to the surface. Utility access boxes are installed slightly above grade. Locking, watertight caps are installed to prevent unauthorized access to the well, and limit infiltration of surface fluids.

FLUID LEVEL MONITORING

Fluid levels are monitored in the wells using an electronic interface probe with conductance sensors. The presence of liquid-phase hydrocarbons is verified using a hydrocarbon-reactive paste. The depth to liquid-phase hydrocarbons and water is measured relative to the well box top or top of casing. Well boxes or casing elevations are surveyed to within 0.02 foot relative to a county or city benchmark.

GROUNDWATER PURGING AND SAMPLING

Groundwater monitoring wells are purged and sampled in accordance with standard regulatory protocol. Typically, monitoring wells that contain no liquid-phase hydrocarbons are purged of groundwater prior to sampling so that fluids sampled are representative of fluids within the formation. Temperature, pH, and specific conductance are typically measured after each well casing volume has been removed. Purging is considered complete when these parameters vary less than 10% from the previous readings, or when four casing volumes of fluid have been removed. Samples are collected without further purging if the well does not recharge within 2 hours to 80% of its volume before purging.

The purged water is either pumped directly into a licensed vacuum truck or temporarily stored in labeled drums prior to transport to an appropriate treatment or recycling facility. If an automatic recovery system (ARS) is operating at the site, purged water may be pumped into the ARS for treatment.

Groundwater samples are collected by lowering a 1.5-inch-diameter, bottom-fill, disposable polyethylene bailer just below the static water level in the well. The samples are carefully transferred from the check-valve-equipped bailer to 1-liter and 40-milliliter glass containers. The sample containers are filled to zero headspace and fitted with Teflon-sealed caps. Each sample is labeled with the project number, well number, sample date, and sampler's initials. Samples remain chilled at approximately 4°C prior to analysis by a state-certified laboratory.

CHAIN OF CUSTODY PROTOCOL

Chain of custody protocol is followed for all soil and groundwater samples selected for laboratory analysis. The chain of custody form(s) accompanies the samples from the sampling locality to the laboratory, providing a continuous record of possession prior to analysis.

DECONTAMINATION

Drilling and Soil Sampling

Drilling equipment is decontaminated by steam cleaning before being brought onsite. The augers are also steam cleaned before each new boring is commenced. Prior to use, the sampler and sampling tubes are brush-scrubbed in a Liquinox and potable water solution and rinsed twice in clean potable water. Sampling equipment and tubes are also decontaminated before each sample is collected to avoid cross-contamination between borings.

Groundwater Sampling

Purging and sampling equipment that could contact well fluids is either dedicated to a particular well or cleaned prior to each use in a Liquinox solution followed by two tap water rinses, prior to analysis.