

**WORK PLAN
FOR
SUPPLEMENTAL GROUNDWATER QUALITY INVESTIGATION
AT
4629 MARTIN LUTHER KING JR. WAY
OAKLAND, CALIFORNIA**

Prepared for:
Ms. Lynn Nightingale
San Francisco, California

July 14, 1998

ADVANCED ASSESSMENT AND REMEDIATION SERVICES

3800 Vista Oaks Dr., Suite 201
Martinez, CA 94553
Phone: (510) 370-8295
Fax: (510) 370-2335
e-mail: aars@ccnet.com



ADVANCED ASSESSMENT AND REMEDiation SERVICES (AARS)

3800 VISTA OAKS DRIVE, SUITE 201
MARTINEZ, CALIFORNIA 94553
TEL: (510) 370-8295 FAX: (510) 370-2335
e-mail: aars@ccnet.com

July 14, 1998

Ms. Eva Chu
Alameda County Health Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Room 250
Alameda, California 94502-6522

**Subject: Transmittal of Work Plan for Supplemental Groundwater Quality Investigation
at 4629 Martin Luther King, Jr. Way, Oakland, California**

Dear Ms. Chu:

Enclosed is the work plan for a supplemental groundwater quality investigation at the above referred site. The investigation will be conducted in accordance with the guidelines and requirements of the Alameda County Health Department (ACEHD) and the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB).

We will proceed with our work plan, after receiving the Pre-Approval from SWRCB and the permit from Zone 7 Water Agency.

Please call me at (925) 370-8295 if you have any questions regarding this work plan.

Sincerely,

Advanced Assessment and Remediation Services

Tridib K. Guha, R.G., R.E.A.
Principal

cc Ms. Lynn Nightingale, San Francisco, California

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 BACKGROUND 1

3.0 PROPOSED SCOPE OF WORK 2

 Task 1: Submit work plan and acquire permits 2

 Task 2: Drill soil borings; install monitoring wells/temporary wells 2

 Task 3: Sample temporary wells 3

 Task 4: Develop, sample and survey monitoring wells 3

 Task 5: Analyze one soil sample for physical index properties 4

 Task 6: Analyze soil samples for specific constituents 4

 Task 7: Analyze groundwater samples for specific constituents 4

 Task 8: Analyze data laboratory results and prepare report 4

4.0 SITE SAFETY PLAN 5

5.0 PROPOSED SCHEDULE OF ACTIVITIES 5

6.0 PROPERTY OWNER AND CONSULTANT 5

APPENDIX A Figure 1, Site Plan
 Proposed Well Construction Diagram

APPENDIX B Site Safety Plan

WORK PLAN
for
SUPPLEMENTAL GROUNDWATER QUALITY INVESTIGATION
at
4629 Martin Luther King, Jr. Way
Oakland, California

1.0 INTRODUCTION

This work plan presents the scope of work to conduct a supplemental groundwater quality investigation at 4629 Martin Luther King, Jr. Way, Oakland, California. The proposed scope of work is based on previous analytical results of soil and groundwater sampling conducted during tank removal and site investigation. Analytical results of the soil and groundwater samples at the site detected high concentrations of petroleum hydrocarbon constituents. The proposed investigative work is designed to evaluate the extent of the contaminant plume within the property.

2.0 PROJECT BACKGROUND

"In July 1992, five underground storage tanks (previously two tanks stored gasoline and three stored fuel oil) were excavated and removed by SEMCO Inc.. Soil samples were collected from excavations. Analytical results indicated that petroleum hydrocarbons, quantified as diesel and oil & grease, were present in the soil below the fuel tanks. Additionally, toluene, ethylbenzene and xylenes were detected at low concentrations in the soil. Petroleum hydrocarbons and benzene, toluene, ethylbenzene and xylenes (BTEX) were not detected in samples obtained from the gasoline tank excavations at concentrations above the reporting limits"[Subsurface Consultants, Inc.(SCI) 1993].

In May 1993, SCI conducted site investigation by drilling and sampling of nine soil borings and analyzing selected soil samples. SCI reported oil and grease and diesel hydrocarbons were detected in the soil beneath and adjacent to the previous fuel oil tanks, at concentrations up to 760 and 1700 mg/kg, respectively.

In September 1995, Advanced Assessment and Remediation Services (AARS) conducted a groundwater quality investigation by drilling and installing two temporary wells (TW-1 and TW-2) and one monitoring well (MW-1). Soil and groundwater samples were collected. The results of groundwater sampling indicated that the concentrations of TRPH as TOG range between 3.7 and 9.9 ppm; TPHg range between 190 and 580 ppb; TPHd ranges between 1,600 to 20,000 ppb. Benzene was detected in groundwater sample from MW-1 at a concentration of 2.3 ppb. Higher lead concentrations in groundwater samples from TW-1 and TW-2 may be due to high sediment contents. Analytical results of soil samples from each boring detected TPHg ranging from 38 to 500 ppm, TPHd ranging from 33 to 200 ppm, TRPH as TOG ranging from 100 to 380 ppm.

3.0 PROPOSED SCOPE OF WORK

The proposed site investigation will be conducted in accordance with the requirements and guidelines of Alameda County Environmental Health (ACEHD) and California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB).

AARS prepared this work plan and will perform the following Tasks:

- Task 1. Submit Work plan and acquire necessary permits;
- Task 2. Drill soil borings; install two monitoring wells and three temporary wells;
- Task 3. Sample temporary wells;
- Task 4. Develop, sample and survey monitoring wells;
- Task 5. Analyze one soil sample for physical index properties;
- Task 6. Analyze soil samples for specific constituents;
- Task 7. Analyze water samples for specific constituents;
- Task 8. Analyze field data and laboratory results and prepare report.

The location of the monitoring wells and temporary wells are presented in Figure 1. The various tasks associated with this site investigations are discussed below

Task 1: Project Preparation, Submit Work Plan and Acquire Necessary Permits

Information pertinent to the site will be reviewed and will include available literature, previous field work and other sources. A work plan will be prepared, including a health and safety plan, and will be submitted to the ACEHD, as well as Ms. Nightingale, property owner. All required permits will be obtained and field activities will be coordinated with the Hazardous Materials Division of the ACEHD. Site will be marked and Underground Service Alert will be notified prior to drilling of soil borings.

Task 2: Drill Soil Borings; Install two Monitoring Wells and three Temporary Wells

Two soil borings (MW-2 and MW-3) will be drilled to 30 feet below ground surface (bgs) by using a limited access drilling rig with 8-inch-diameter, hollow-stem augers, following the standard procedures and requirements of the ACEHD. Three additional soil borings (TW-3, TW-4 and TW-5) will be drilled to 25 feet bgs using small diameter (4.5-inch) solid flight augers. Soil samples will be obtained with a split-spoon sampler lined with clean sampling sleeves. Soil samples will be collected at every 5 feet or at any lithologic changes, starting at 5 feet bgs. Soil borings will be logged lithologically using the Unified Soil Classification System (USCS) and soil samples will be screened in the field using a portable combustible gas indicator. The samples recovered for chemical analysis will be sealed with teflon tape and plastic caps and placed immediately into a cooler with ice and transported to a certified laboratory under chain-of-custody. If groundwater is not encountered within the specified depth described above then the soil borings will be backfilled with neat cement or cement slurry.

Two soil borings (MW-2 and MW-3) will be converted to groundwater monitoring wells. The groundwater monitoring wells will be constructed of clean, 2-inch diameter, flush threaded, schedule 40 PVC blank casing which will be extended from grade level to a depth estimated at the highest anticipated water level, and 2-inch-diameter screened casing with 0.010-inch perforations, extending to a depth of at least 10 feet into the water table. The annular space surrounding the screened portion will be backfilled with No. 2 Monterey sand (filter pack) to approximately 2 feet above the top of the screened section. A bentonite annular seal (approximately 1 foot thick) will be placed above the filter pack. The remaining annulus will be grouted with neat cement to the surface. A monument well box will be installed slightly above grade to minimize infiltration of surface waters. Locking watertight well caps will be installed to ensure the integrity of the well.

All drill cuttings will be stockpiled at the site for proper disposal.

Task 3: Sample three Temporary Wells

Three soil borings (TW-3, TW-4 and TW-5) will be converted to temporary wells. The soil borings will be advanced 3 to 5 feet beyond the top of the saturated zone (approximately 22 feet bgs). A 2-inch diameter, flush-threaded, Schedule 40 PVC 0.010-inch slot size screen casing covered with a polyester filter sock will be installed in the bore holes. The water will be allowed to stabilize and a small volume of water (approximately 3 to 5 gallons) will be purged. Following purging, a water sample will be collected and the casing will be removed. The borings will then be completely backfilled with neat cement or cement slurry to grade.

Task 4: Develop, Sample and Survey Monitoring Wells

Prior to sampling, the water level of the well will be recorded, and the presence of free product or sheen will be observed. Both wells, MW-2 and MW-3, will be properly developed prior to purging and sampling.

During purging, pH, temperature, and conductivity readings will be recorded. As these readings stabilize, indicating that the groundwater is representative of the water in the aquifer, the water samples will be collected in appropriate clean glassware. Also, Monitoring well, MW-1 will be sampled. The samples will be placed in an iced cooler and transported to a California-certified laboratory.

To calculate the hydraulic gradient and groundwater flow direction of the shallow aquifer, the wells will be surveyed from a permanent reference mark at the top of the casing, to 0.01 foot accuracy in reference to a common datum.

The removed water will be transferred to 55-gallon drums, labeled and stored at the site for proper disposal.

Task 5: Analyze One Soil Sample for Physical Index Properties

~~with~~ total carbon content

One soil sample (clean) will be collected to analyze for physical index properties, i.e. bulk density, moisture content, specific gravity, and grain size distribution including hydrometer. This physical properties evaluation is necessary for risk evaluation. The analysis will be conducted in a California approved geotechnical laboratory and will meet ASTM standard.

Task 6: Analyze Soil Samples for Specific Chemical Constituents

Soil samples will be transported to American Environmental Network in Pleasant Hill, a California-certified laboratory for analysis following proper chain of custody procedures. A minimum of 1 soil sample (capillary zone) from each boring will be analyzed for TPHd-mo, TPHg with BTEX/MTBE and chlorinated solvents (CL HC) using the appropriate EPA methods. The detection limits for both TPHd and TPHg is 1.0 milligram per kilogram (mg/kg) and the detection limits for BTEX/MTBE are 0.005 mg/kg. The detection limit for CL HC is as per EPA guidelines.

Task 7: Analyze Groundwater Samples for Specific Chemical Constituents

Groundwater samples collected from the monitoring wells and temporary wells will be analyzed for TPHd-mo, TPHg with BTEX/MTBE distinction, CL HC and total lead, using the appropriate EPA methods. The detection limits for TPHd-mo and TPHg is 50 microgram per liter ($\mu\text{g/L}$) and the detection limits for BTEX/MTBE are 0.5 $\mu\text{g/L}$. The detection limit for CL HC is as per EPA guidelines and detection limit for lead is 0.005 mg/L.

does characterize mineral spirits *soluble (filter sample)*

Task 8: Analyze Data and Laboratory Results and Prepare Report

Upon completion of the sample analysis and background research, a detailed evaluation of results and available information will be conducted to assess the extent and nature of groundwater contamination. This will include:

- . Interpretation of geologic and hydrogeologic information.
- . Description of field and analytical procedures.

Tabulation of soil and groundwater analytical results

A report presenting the findings of the investigation including conclusions and recommendations, will be prepared for submission to the ACEHD

4.0 SITE SAFETY PLAN

All field procedures and activities related to the conduct of the site investigation will be in accordance with the site specific safety plan has been developed in compliance with applicable requirements of the California Department of Health Services (DHS) and the Federal and State Occupational Health and Safety Administration (OSHA and Cal-OSHA). The site safety plan is presented in APPENDIX B.

5.0. PROPOSED SCHEDULE OF ACTIVITIES

The proposed schedule includes completion of the following items:

<u>Items</u>	<u>Cumulative Days</u>
- Work plan and health and safety plan	5
- Receipt of the soil borings/monitoring well permit from the Zone 7 Water Agency	10
- Field work and sample collection	25
- Chemical analyses	40
- Data analyses, integration and interpretation	70
- Report preparation	90

This schedule may be subject to revision depending on timely receipt of work plan approval and approval of boring/well permit to complete the site investigation. Any changes to the schedule will be communicated in advance to the appropriate agencies and parties involved.

6.0 PROPERTY OWNER AND CONSULTANT

Property owner: Ms. Lynn Nightingale Trustee of The Uncle Sid Trust
1390 Market Street, Suite 1204
San Francisco, California 94102-5306

Contact: Ms. Lynn Nightingale (415) 554-0200

Consultant: Advanced Assessment and Remediation Services
3800 Vista Oaks Drive, Suite 201
Martinez, California 94553

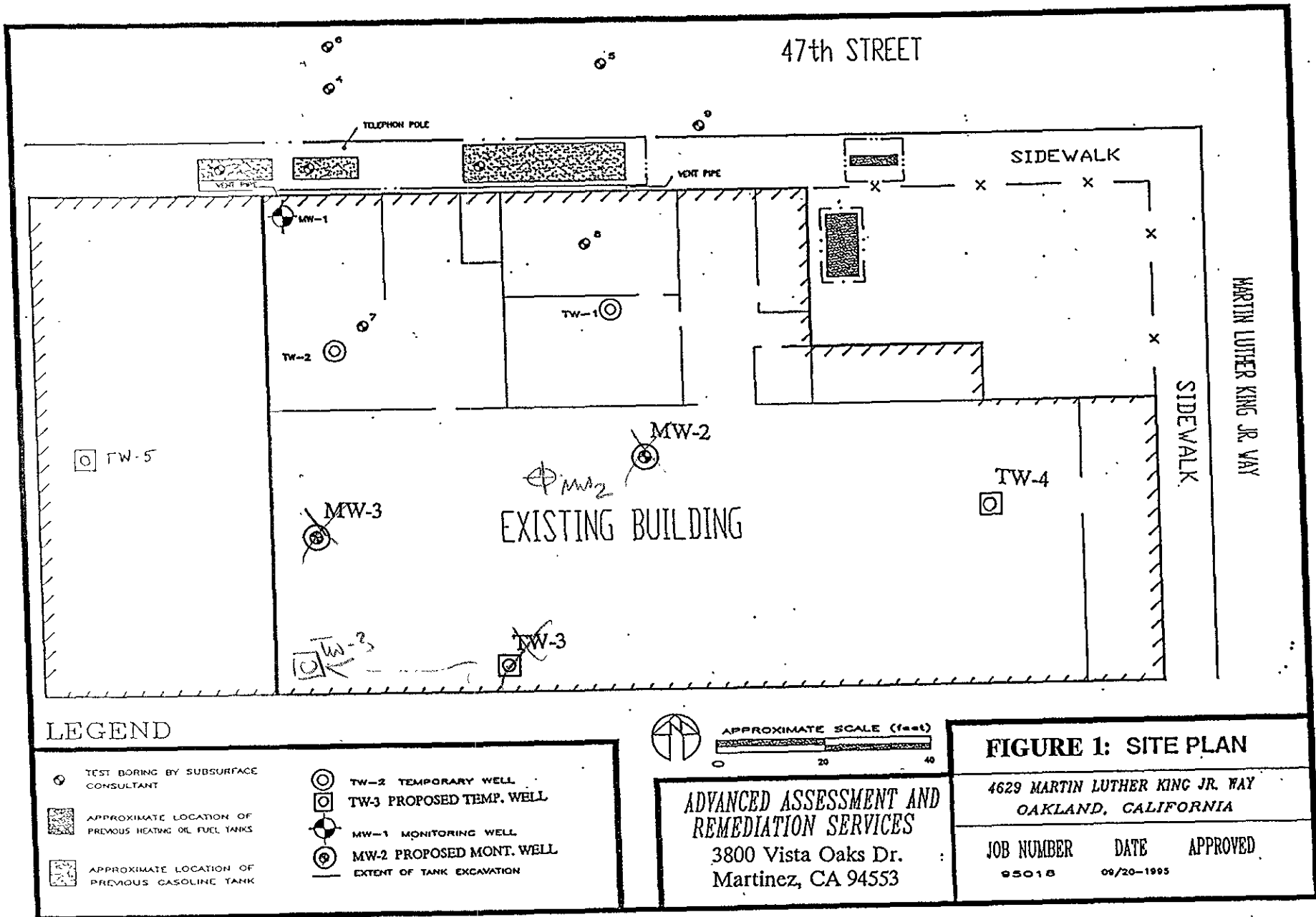
Contact: Tridib Guha (925) 370-8295

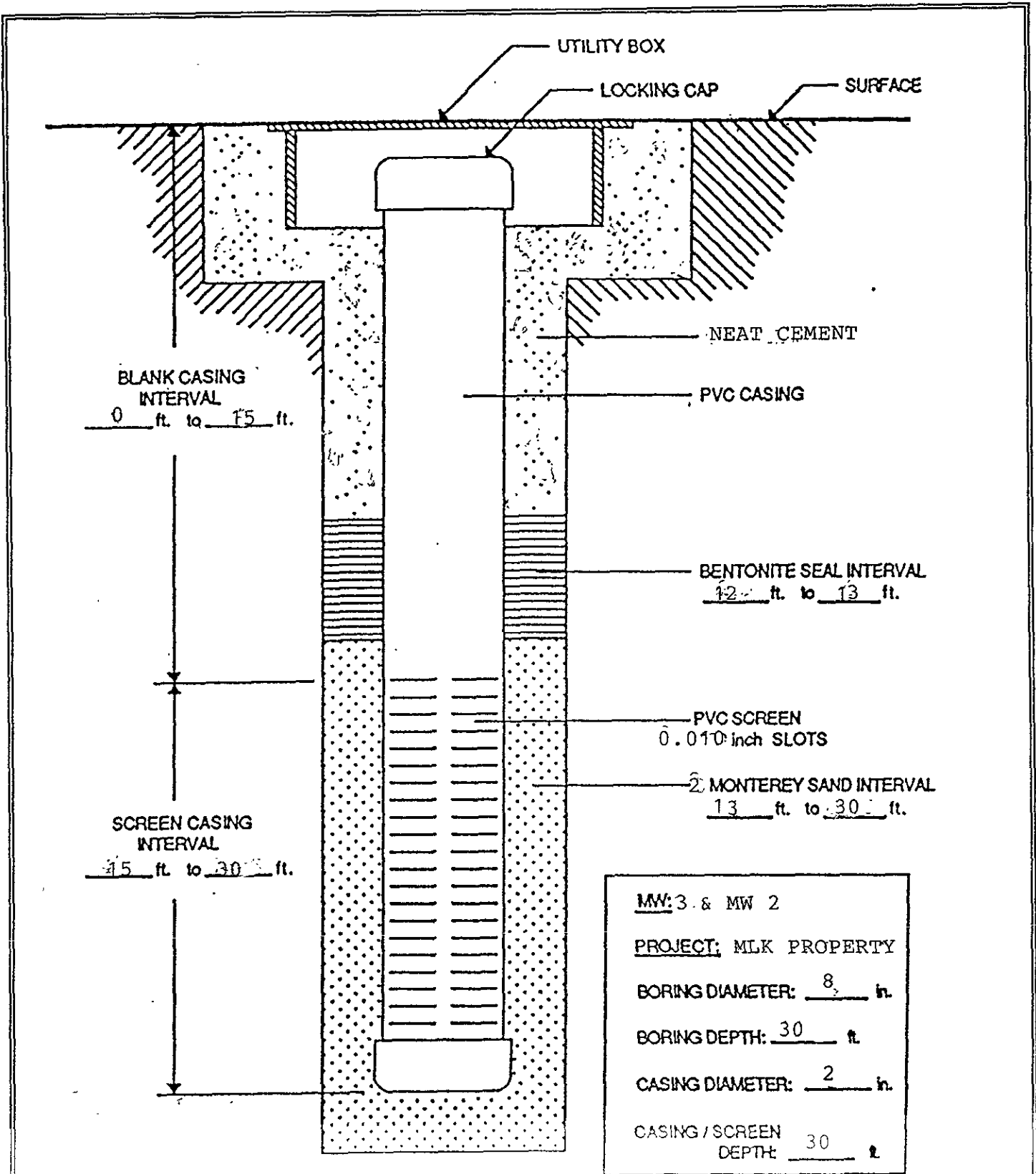


Tridib K Guha, R.G

APPENDIX A

**Site Plan
Proposed Well Construction Diagram**





NOT TO SCALE

PROPOSED WELL CONSTRUCTION DIAGRAM

Advanced Assessment and
Remediation Services
3800 Vista Oaks Drive
Martinez, CA 94553

APPENDIX B

Site Safety Plan

SITE SAFETY PLAN
4629 Martin Luther King, Jr. Way
Oakland, California

INTRODUCTION

This site safety plan has been prepared pursuant to requirements of Alameda County Environmental Health Department (ACEHD). This plan has been prepared in conformance with the Advanced Assessment and Remediation Services (AARS) Health and Safety Program. It addresses those activities associated with site characterization and will be implemented during all site investigations and field related activities. Compliance with this Site Safety Plan (SSP) is required of all AARS personnel, subcontractors, and third parties who enter the site. The requirements and parameters identified in this SSP will be subject to modification as warranted by existing site conditions or as work progresses. However, no changes will be made without the prior approval of the Project Safety Officer.

PROJECT SAFETY OFFICER

The Project Safety Officer has overall responsibility for the development, coordination, and implementation of the SSP and its conformance with the AARS Health and Safety Program. The Project Safety Officer will also be responsible for field implementation of the SSP. This will include communicating the site-specific requirements to all site personnel and third parties, and assuring compliance with the AARS Health and Safety Program.

AARS PERSONNEL AND SUBCONTRACTORS

All AARS personnel and Subcontractors will be responsible for reading, understanding, signing, and complying with these SSP requirements.

BACKGROUND

In July 1992, five underground storage tanks (previously two tanks stored gasoline and three stored fuel oil) were excavated and removed by SEMCO Inc.. Soil samples were collected from excavations. Analytical results indicated that petroleum hydrocarbons, quantified as diesel and oil & grease, were present in the soil below the fuel tanks. Additionally, toluene, ethylbenzene and xylenes were detected at low concentrations in the soil. Petroleum hydrocarbons and benzene, toluene, ethylbenzene and xylenes (BTEX) were not detected in samples obtained from the gasoline tank excavations at concentrations above the reporting limits.

In May 1993, SCI conducted site investigation by drilling and sampling of nine soil borings and analyzing selected soil samples. SCI reported oil and grease and diesel hydrocarbons were detected in the soil beneath and adjacent to the previous fuel oil tanks, at concentrations up to 760 and 1700 mg/kg, respectively

In September 1995, AARS conducted a groundwater quality investigation by drilling and installing two temporary wells and one monitoring well. Analytical results of soil and groundwater sample at the site detected high concentrations of petroleum hydrocarbon constituents

HAZARD SUMMARY

Major potential hazards to personal safety at the site include:

A. Physical Injury

Exposure to this type of injury can occur while working around heavy equipment during the different field operations; e.g., drilling and associated work.

B. Explosion and Fire

Petroleum products are highly flammable. Liquid petroleum product readily vaporizes from standing pools or saturated soil. Ignition sources of any kind; e.g., engines, impact sparking, and heat or arc from inappropriate equipment or instrumentation pose a major explosion and fire hazard.

C. Inhalation, Ingestion, or Absorption of toxic vapors, liquids, or dusts associated with petroleum hydrocarbons, and organic chemicals

Gasoline vapors in high concentrations (> 300 parts per million (ppm)) can cause eye, nose, and throat irritation, headaches, dizziness, and anesthesia. Skin contact and/or absorption of gasoline may result in irritation and dermatitis. Contact with specific toxic petroleum hydrocarbon and organic chemicals substances such as the following volatile organic compounds (VOC): benzene, toluene, ethylbenzene, and xylenes (BTEX) may seriously affect an individuals health. Benzene is a suspected human carcinogen and along with toluene and xylenes can cause damage to the liver, kidneys, and central nervous system. Ethylbenzene is also known to be a skin irritant in both vapor and liquid forms.

D. Electrical Shock or Electrocutation

Electrical power lines are known to be in the vicinity of both drilling and hand augering operations.

E. Hearing Damage

Noise from the drilling will be both constant and extensive.

F. Sunburn and Heat Stress

Due to work inside the building, sunburn is not expected. A worker's risk for developing heat stress is greatly increased when wearing impermeable clothing or respirators.

HAZARD ASSESSMENT

Consistent efforts will be made throughout the project to evaluate the chemical and physical and hazards described above. Explosion, fire, and VOC exposure hazards will be evaluated through an air monitoring program. Electrical shock, hearing damage, physical damage, and heat stress will be minimized through a hazard reduction program.

AIR MONITORING PROGRAM

A. Fire and Explosion

A direct-reading portable GasTech combustible gas indicator (CGI) (calibrated to hexane) or a photo ionization detector (PID), which measures VOC concentrations in ppm or as a percentage of the lower explosive limit (LEL), will be used to evaluate the possible formation of flammable atmospheres around the work area. Continuous measurements will be obtained at the top of each borehole throughout the temporary well/monitoring well installation and soil boring operations. Periodic measurements will also be collected in any confined areas that may contain and accumulate combustible vapors.

B. Exposure to VOC's

Airborne concentrations of VOC's will be monitored with the CGI described above, and/or a PID. Measurements will be obtained from the top of each borehole and all soil samples.

HAZARD REDUCTION PROGRAM/ENGINEERING CONTROLS

Access to work areas will be limited by the Project Safety Officer to essential personnel.

Drill cuttings and soil will be stored on site on a plastic liner. The stored soils will be removed from the site at the earliest opportunity by the responsible party. Underground utilities will be identified through Underground Service Alert prior to operation, and power lines and pipelines will be shut down, locked-out and tagged, as appropriate.

A. Flammable Atmospheres

In the event that combustible gas indicator readings anywhere on the site exceed 10% of the LEL of gasoline (11,000 ppm), work will be suspended, monitoring will be continued as necessary to isolate the area of concern, and some or all of the following environmental controls will be implemented as appropriate:

1. Borings or wells emitting excessive VOC concentrations will be ventilated, capped, or shut in as necessary.
2. Drilling equipment will be bonded and grounded during all operations to control ignition sources.

B. Airborne Toxic Chemicals

Workers will be required to wear half-face air purifying respirators with organic vapor cartridges under the following circumstances:

1. if the worker is continuously exposed throughout the day to VOC vapors that exceed the permissible exposure level (time weighted average) (PEL-TWA) for gasoline (300 ppm).
or

2. if the worker is exposed at any time to VOC vapors that exceed the permissible exposure level (short term exposure limit) (PEL-STEL) for gasoline (500 ppm).

Similar precautions will be taken with regard to other toxic chemicals such as BTEX components.

If VOC vapors exceed 1,000 ppm, full-face air purifying respirators with organic vapor canisters will be worn.

C. Physical Contact with Contaminated Soil and Ground Water

Workers who must come in direct contact with contaminated soil or ground water for sampling purposes, will be required to wear protective gloves and/or necessary protective clothing to prevent skin contact.

D. Physical Hazards

Accidents will be prevented by personal protective equipment, engineering controls, and the exercise of reasonable caution during work activities.

E. Noise Exposures

All workers entering high-noise areas will be required to wear hearing protection (ear plugs or muffs).

H. Heat Stress

Monitoring of personnel wearing impermeable clothing will commence when the ambient temperature is above 70 degrees Fahrenheit. Workers will be provided beverages, shaded rest areas, and breaks, as needed, to prevent heat stress.

GENERAL MEASURES AND PROCEDURES

SAFETY INSPECTIONS

Walk-through safety inspections of the work area will be conducted daily before the start of work and as conditions change. The results of these surveys will be communicated to the work crews during regularly scheduled "tailgate safety" meetings. The safety procedures and the day's planned operations will be discussed at these sessions.

PERSONAL PROTECTIVE EQUIPMENT

Field personnel involved in the site investigation will be required to be prepared with the following personal protective equipment:

- * Hard hats
- * Half-face air purifying respirators with organic vapor cartridges and dust/mist filters
- * Safety glasses with side-shields, or splash goggles
- * Tyvek coveralls and other suitable work clothing

- * Chemical-resistant gloves
- * Steel-toe boots or boot covers
- * Hearing protectors or ear plugs

EMERGENCY RESPONSE

The Project Safety Officer will have controlling authority during an emergency. In the event that this person is not available, the Alternate Safety Officer (driller) will be in charge. Emergency response organizations and contacts are listed at the end of this plan.

GENERAL SAFETY REQUIREMENTS

The following requirements will also be observed:

1. The Project Safety Officer has the authority to correct unsafe site conditions. All accidents, injuries, and potentially unsafe working conditions shall be reported to the Project Safety Officer immediately.
2. Eating, smoking, and drinking will be allowed only in designated off-site areas. Site personnel will wash their hands and faces thoroughly prior to eating or drinking.
3. Respirators will be cleaned, sanitized, inspected, and maintained by workers after each use.
4. Fire extinguisher will be on-site for use on equipment or small fires only.
5. An adequately stocked first aid kit will be on-site at all times during work activities.

All practical engineering and geological information, experience, and accepted practices will be employed as necessary to control any and all aspects of site safety while carrying out the proposed site investigation work.

LIST OF KEY PERSONNEL

<u>Project Safety Officer:</u>	Tridib Guha,	AARS.
<u>Alternate Safety Officer:</u>	Driller,	Gregg Drilling & Testing, Inc

<u>AARS</u>	Day Time Phone # (925) 370-8295
<u>Client Contact:</u>	Ms. Lynn Nightigale (415) 554-0200

EMERGENCY TELEPHONE NUMBERS

911	Police, Fire and Ambulance
(510) 204-1303	Alta Bates Hospital
1-800-258-6492	Hazardous Waste Hotline (California DHS)
1-800-342-9293	Poison Control Hotline

HOSPITAL ADDRESS AND ROUTE

Name: Alta Bates Medical Center
Address: 2450 Ashby Avenue
Berkeley, California


Phone Number:
General (510) 204-4444
Emergency Room (510) 204-1303

Location and Directions:

Alta Bates Emergency Room is on Ashby Avenue one block east of Telegraph Ave. on the south side of Ashby.

From the site go north on Martin Luther King, Jr. Way to Ashby Avenue. Turn right down Ashby Avenue. Hospital driveway is the next driveway on the left after Hospital Building (Colby). Emergency Room is just past main hospital building on the left.

This site safety plan is prepared and reviewed by:



Tridib K. Guha
Project Safety Officer