PORT OF OAKLAND

March 8, 1995

Barney M. Chan
Alameda County
Environmental Protection Division
1131 Harbor Bay Pkwy.,#250
Alameda, CA 94502-6577

SUBJECT: REVISED WORK PLAN FOR LIMITED SUBSURFACE INVESTIGATION QUARTERLY SAMPLING AND FREE PHASE RECOVERY AT KEEP ON TRUCKING 370 - 8TH STREET IN OAKLAND, CALIFORNIA

Dear Mr. Chan:

Enclosed please find the revised Work Plan for Limited Subsurface Investigation, Quarterly Sampling and Free Product Phase Recovery at Keep on Trucking, 370 - 8th Street in Oakland, California. The Work Plan is revised per your comments to Clayton Environmental.

We will assume this Work Plan is acceptable and plan to start work at the site during the week of March 20, 1995 unless we are otherwise directed by you. As we have discussed, we would like to coordinate this work with the work described in the previously submitted (February 24, 1995) Work Plan Subsurface Investigation for the recently removed underground tank. Please let us know if you have any revisions.

I will be on vacation from March 9, 1995 to March 22, 1995. Neil Werner (272-1176) will be the Port's Environmental Department contact during that period.

I appreciate your assistance on this project.

Sincerely,

Susa Gates
Environmental Scientist

SG\jb

w/Enclosures

cc: Richard Padovani, Terminal Manager, Keep on Trucking Co. Inc., 370 - 8th Avenue, Oakland, CA 94606
Rich Hiett, SFRWQCB, 2101 Webster St., 5th Floor, Oakland, CA 94612

w/o Enclosures

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Clayton
ENVIRONMENTAL
CONSULTANTS

Work Plan
for
Limited Subsurface Investigation
Quarterly Sampling and
Free Phase Recovery
at the
Keep On Trucking Site
Oakland, California

Clayton Project No. 59007.00
Revised February 21, 1995

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1.0 INTRODUCTION

Clayton Environmental Consultants, Inc. was retained by the Port of Oakland to prepare a work plan and perform a soil and groundwater investigation at the Keep On Trucking facility located at 370 8th Avenue in Oakland, California.

The site is located in a commercial area of the City of Oakland, southeast of 8th Street (Figure 1). Keep On Trucking Company, a tenant of the Port of Oakland, previously operated a fueling system at the site. The fueling system was removed after it was discovered that the system was the source of the nearby diesel contamination in soil and groundwater. A subsurface investigation has been performed for this site and Alameda County Health Care Services Agency has requested additional work on this site.

This work plan was prepared to present a plan to further characterize the soil and groundwater contamination at the site. This work plan includes quarterly monitoring and sampling of the existing wells. In addition, interim product removal measures have been proposed to address the separate phase product identified in one well on-site.

2.0 BACKGROUND

In October 1992 the United States Coast Guard (USCG) noted diesel in Clinton Basin. A subsequent investigation by the Port of Oakland identified diesel in the storm drains at the Ninth Avenue Terminal. Port of Oakland immediately began remediation and clean up activities of the storm drains. Subsequent investigations by the Port of Oakland indicated that the source of diesel to be a leaking underground piping system associated with a diesel aboveground storage tank (AST) used by Keep On Trucking Company at the subject site.

During the period from December 1992 to February 1993, the fuel system was disconnected and removed from the site. The contaminated soil was excavated and removed from the site in April 1993. During the excavation activities a previously unknown underground storage tank (UST) was discovered and removed from the site by Riedel Environmental Services.

During August through December 1993, Uribe and Associates conducted a subsurface investigation at the site. The investigation included installation and sampling of four monitoring wells (MW-1 through MW-4). The location of these monitoring wells is shown in Figure 2. The soil and groundwater samples collected from the monitoring wells were analyzed for total petroleum hydrocarbons as diesel (TPH-D). In addition the groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX). Table 1 is the analytical summary for the soil samples collected from the monitoring wells.

Table 1
Analytical Summary for the Soil Samples
Collected August and September 1993
All concentrations in milligrams per kilograms (mg/kg)

Well Number	MW-1	MW-1	MW-2	MW-2	MW-2	MW-3	MW-3	MW-3	MW-4	MW-4	MW-4
Depth	10.5	16.0	6.0	10.5	15.5	5.0	15.0	20.0	5.5	10.5	15.5
TPH-D	9	ND	ND	1	ND	120	3	ND	7,100	520	6

TPH-D Total petroleum hydrocarbons as diesel
ND Not detected at or above the analytical detection limit

The groundwater analytical results for samples collected in September 1993 are summarized in Table 2.

Table 2
Analytical Summary for the Groundwater Samples
Collected September 1993
All concentrations in micrograms per liter (µg/l)

	MW-1	MW-2	MW-3	MW-4
TPH-D	1,600	1,900	680	1,300
Benzene	ND	0.5	ND	140
Toluene	ND	ND	0.3	110
Ethylbenzene	ND	ND	ND	40
Xylenes	ND	ND	ND	235

TPH-D Total petroleum hydrocarbons as diesel
ND Not detected at or above the analytical detection limits

During the monitoring well development activities in September 1993, 4 to 12 inches of separate phase product was observed in monitoring well MW-4. The monitoring well MW-4 was purged once per week from September to November 1993 by Uribe and Associates to remove the separate phase product from the well. According to the Uribe and Associate report dated December 2, 1993, the "bailing activities ceased on November 1, 1993, after all the diesel had apparently been removed. The last two weeks of bailing recorded only a sheen still present on the water." However, during the quarterly groundwater monitoring and sampling in June and September 1994, 6 to 10 inches of separate phase product was noted in monitoring well MW-4.

3.0 TECHNICAL RATIONALE

Previous investigations at the subject site have indicated that soil and groundwater contamination may exist beyond the boundaries established by monitoring wells MW-1

through MW-4. In addition, separate phase product exists in monitoring well MW-4. To further delineate the soil and groundwater contamination, Clayton will install two additional monitoring wells (MW-5 and MW-6). The location of these monitoring wells were revised based on the Alameda County Health Care Services Agency's (ACHCSA) telephone request on January 31, 1995.

In order to address the separate phase product in well MW-4, Clayton will install a passive skimmer. The passive skimmer will collect separate phase product which enters the well using a membrane which only allows product to pass through. The product in the skimmer will be emptied into a double contained storage drum at least once every 2 weeks and a record of the volume removed will be kept. will need : CAP , RAP

To evaluate the groundwater flow direction and extent of groundwater contamination at the site, groundwater depths will be measured and samples will be collected quarterly. The results of the subsurface investigation and interior product skimming activities will be evaluated to determine future remedial actions at the site.

3.1 SCOPE OF WORK

This work plan describes activities planned at the Keep On Trucking facility to perform an interim remedial action and further investigate the extent of the soil and groundwater contamination near the former AST. The tasks required to perform these activities are described in the following subsections.

3.1.1 Task 1: Health and Safety Plan

A health and safety plan will be prepared for the work outlined in this work plan in accordance with the requirements of Title 29 of the Code of Federal Regulations, Section 1910.120 (29 CFR 1910.120) and California Occupational Safety and Health Administration (Cal/OSHA) General Industry Safety Order (GISO) 5192.

3.1.2 Task 2: Drilling and Monitoring Well Installation Permits

Before commencing the field activities Clayton will obtain the necessary permits from the Zone 7 Water Agency.

3.1.3 Task 3: Identification of Underground Utility Trenches

Clayton will contact Underground Service Alert (USA) to identify the utilities leading to the site. The identified utilities will be marked on the ground. Clayton will not drill within 3 feet from each side of a known utility line.

3.1.4 Task 4: Borehole Drilling and Soil Sample Collection

To further define the horizontal extent of soil and groundwater contamination, Clayton will drill two boreholes, near the monitoring well MW-4. These boreholes will be converted into monitoring wells MW-5 and MW-6 (Figure 2).

The soil samples will be collected at approximately 5 foot intervals, using a 2.5-inch split barrel sampler. The groundwater table beneath the site is estimated at 5 feet below ground surface (bgs). Therefore, the soil sample for laboratory analysis will be collected at

approximately 4 feet bgs. To aid in locating contamination, Clayton will screen the soil cuttings during drilling using a photoionization detector (PID), and visual senses to detect petroleum compounds. If contamination is encountered other than at the specified sampling depth, Clayton will collect additional samples until groundwater is encountered. No soil samples will be collected for laboratory analysis below the saturated zone.

The soil samples will be collected in precleaned brass tubes for the purpose of lithologic logging. The brass tubes selected for analysis will be sealed with teflon sheets, plastic caps, and immediately placed in an iced cooler for transfer to a State-certified laboratory. Legal chain-of-custody procedures will be followed for handling of soil samples.

The soil cuttings and sampling spoils generated by the drilling process will be placed into individually labeled, Department of Transportation (DOT)-approved 55-gallon drums and left on site until proper disposal can be determined based on laboratory analysis.

3.1.5 Task 5: Monitoring Well Installation

The boreholes (at least 6 inches in diameter and approximately 15 feet deep) will be converted into monitoring wells using a 2 inch diameter schedule 40 polyvinyl chloride (PVC) casing. Because of the shallow water table, screened casing will be extended 1-foot above the water table (approximately four feet bgs). Solid casing will then be installed to the surface. The sand pack will extend 1-foot above the screen. A 1/2-foot bentonite seal will be placed on top of the sand pack and the well will be sealed to the surface using cement grout. A locking cap will secure the well in a Christie box raised above the surface grade by approximately 1 inch to prevent surface run-off from entering the well head.

Drilling and sampling activities will be conducted in accordance with Clayton's drilling, well construction and sampling protocols for borehole/monitoring well installation (see appendix), under the supervision of a Clayton geologist registered in the State of California.

3.1.6 Task 6: Monitoring Well Development and Sampling

The well seals in the newly constructed wells will be allowed to set for at least 48 hours prior to well development. The wells will then be developed to increase their yield and minimize the fine-grained material entering the well casing. Well development will be accomplished by removing finer materials from the natural formations surrounding the perforated sections of the wells. Development of the well can volatilize present contaminants; therefore, the wells will be allowed to settle for at least another 48 hours between development and the first purging/sampling event.

Water samples from all six wells will be collected using clean disposable bailers. Water will be collected in clean laboratory supplied containers and placed immediately into an iced cooler for transport to the State-certified laboratory for analysis. The groundwater sampling activities will be conducted in accordance with Clayton's drilling, well construction and sampling protocols for borehole/monitoring well installation (see appendix).

Water generated from well development and sampling will be placed into DOT-approved, 55-gallon drums until laboratory results from groundwater samples can be evaluated to determine the proper disposal method.

3.1.7 Task 7: Well Head Survey

rel to MSL

The monitoring wells will be surveyed by a licensed land surveyor using a surveyed benchmark. The surveyed elevations and locations of the wells will be used to confirm the local groundwater flow direction and gradient.

3.1.8 Task 8: Laboratory Analysis

Two (one per borehole) soil samples and six water samples will be collected and transported to a state-certified laboratory.

The soil and groundwater samples will be analyzed using the following United State Environmental Protection Agency (USEPA) Methods in accordance with the Regional Water Quality Control Board (RWQCB) guidelines for minimum verification analyses for leaking diesel tanks:

- USEPA Method 8020 for BTEX
- USEPA Method 8015 for TPH-D (please add TPHg)

3.1.9 Task 9: Quarterly Groundwater Monitoring and Sampling

Clayton will monitor and collect groundwater samples each quarter, for four quarters, from the six monitoring wells, MW-1 through MW-6, located onsite. The water samples will be delivered to the State-certified laboratory using proper chain-of-custody procedures. If free phase product is observed in the wells, the thickness will be noted and a water sample will not be collected. Clayton will collect data on the depth to water from each well in order to calculate the average groundwater flow direction and gradient for the subject site.

The quarterly groundwater samples will be analyzed for TPH-D and BTEX.

Water generated from well development and sampling will be placed into DOT-approved, 55-gallon drums until laboratory results from groundwater samples can be evaluated to determine the proper disposal method.

3.1.10 Task 10: Skimmer Installation, Operation, and Maintenance

Clayton will install a passive skimmer in monitoring well MW-4. The skimmed product will be collected in a drum with secondary containment. The content of the drum will be periodically transported to a proper disposal facility.

Clayton estimates that the skimmer will be in place for a period of 6 months. Clayton will inspect the skimmer twice a month and perform necessary maintenance. During the site visits the quantity of recovered product, the product thickness and depth to water will also be noted. The frequency of site visits may be modified based on the rate of product recovery.

3.1.11 Task 11: Data Analysis and Report Preparation

Upon completion of the laboratory analysis, a report will be prepared summarizing the findings of the soil investigation. A discussion of the site investigative techniques, soil and water sampling, analytical results, conclusions, and recommendations will be included in the report.

After completion of each quarterly groundwater monitoring and analysis Clayton will prepare a report summarizing the activities during the quarter. This report will include a discussion of the skimmer operations and the rates of recovery.

4.0 SCHEDULE

The work on this project can begin immediately upon receipt of authorization to proceed from the ACHCSA. Assuming that authorization to proceed is received by January 15, 1995, we estimate that:

- Tasks 1 through 8 and Task 10 can be completed by February 24, 1995
- Task 9 (quarterly monitoring and sampling) can be completed during May, August, and November 1994, and February 1996
- Task 11 (initial site investigation report) can be completed by March 30, 1995
- Task 11 (subsequent quarterly reports) will be completed in June, October, and December 1995, and March 1996

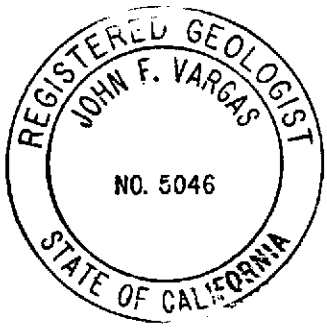
This work plan prepared by: _____

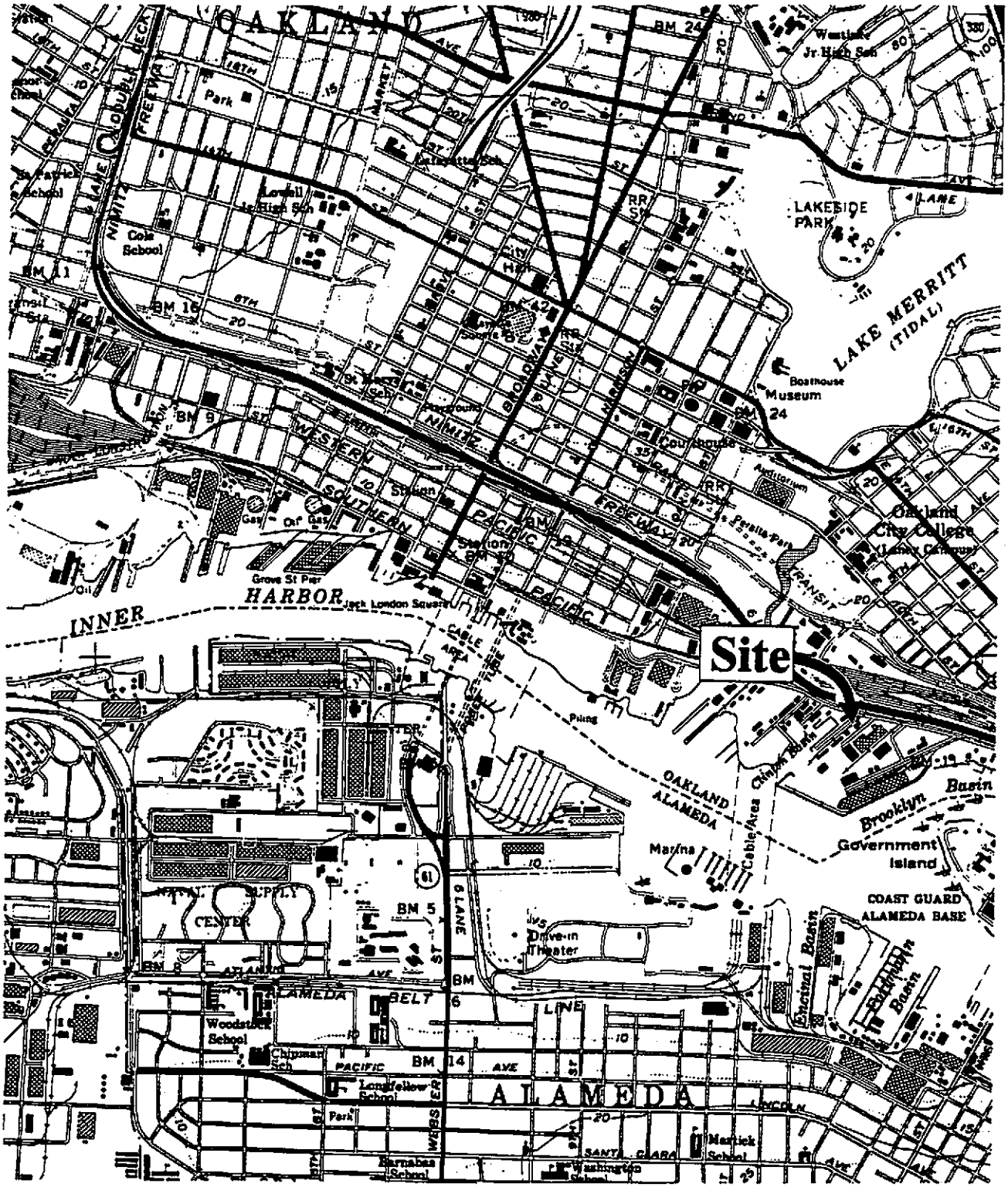
Dariush Dastmalchi
Geologist

This work plan reviewed by: _____

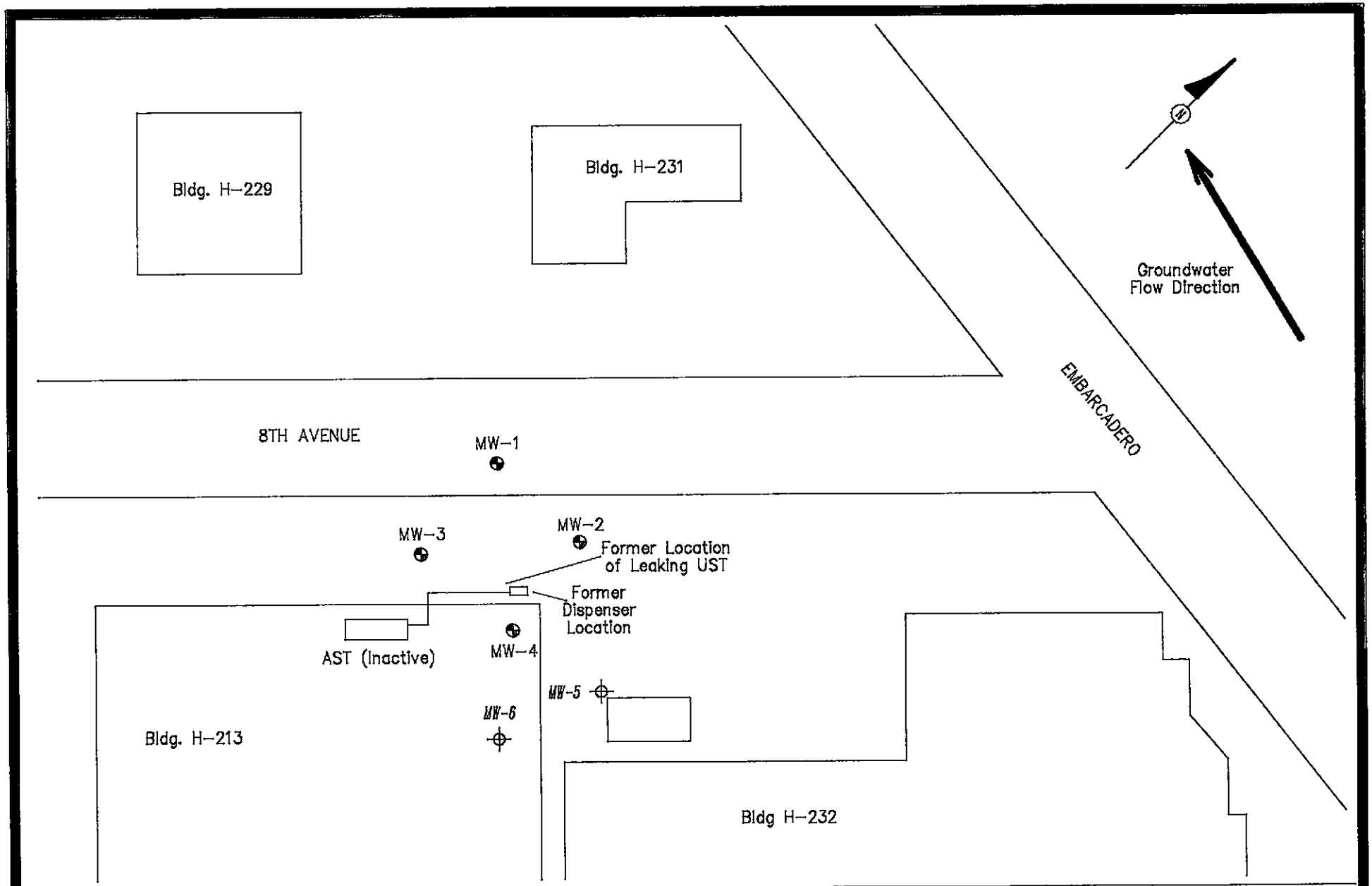
John F. Vargas, R.G.
Supervisor, Geosciences & Remediation
San Francisco Regional Office

February 21, 1995





Site Location and Topographic Map KEEP ON TRUCKING FACILITY 370 8th Street Oakland, California Clayton Project No. 58560.15	Figure 1 58560-15-16	Clayton ENVIRONMENTAL CONSULTANTS	



LEGEND

- Existing Monitoring Well
- Proposed Monitoring Well

(not to scale)

Site Plan, Monitoring Well Locations
KEEP ON TRUCKING
370 8th Avenue
Oakland, California

Clayton Project No. 59007.00

Figure 2

59007-00-16

Clayton ENVIRONMENTAL CONSULTANTS

APPENDIX

DRILLING, WELL CONSTRUCTION, AND SAMPLING PROTOCOLS FOR BOREHOLE/MONITORING WELL INSTALLATION

DRILLING, WELL CONSTRUCTION, AND SAMPLING PROTOCOLS FOR BOREHOLE/MONITORING WELL INSTALLATION

BOREHOLE INSTALLATION

Clayton Environmental Consultants, Inc. acquires the proper governmental agency permits to bore, drill, or destroy all proposed boreholes and monitoring wells that intersect with groundwater aquifers and writes a health and safety plan.

Clayton subcontracts only with drillers who possess a current C-57 water well contractor's license issued by the State of California and whose personnel have attended the OSHA 40-hour Hazardous Materials Safety Training. Prior to starting work, a "tailgate" safety meeting including discussion of the safety hazards and precautions relevant to the particular job will be held with all personnel working on the job. Well drillers are identified on permit applications.

Borings are drilled dry by hollow- or solid-stem, continuous flight augers. Augers, drill rods, and other working components of the drilling rig are steam-cleaned before arriving onsite to prevent the introduction of contaminants. These components are also steam-cleaned between borings away from boring locations. Cleaned augers, rods, and other components are stored, and/or covered when not in use.

Our bore logs include a detailed description of subsurface stratigraphy. Clayton examines the soil brought to the surface by drilling operations, and samples undisturbed soil every 5 feet or as otherwise specified. Soil cuttings are screened for hydrocarbon contamination using a photoionization detector. Boring logs are filled out in the field by a professional geologist, civil engineer, engineering geologist who is registered by the State of California, or a technician who is trained and working under the supervision of one of the previously mentioned persons, using the Unified Soil Classification System.

SOIL SAMPLING

Soil samples are taken every 5 feet, at areas of obvious contamination, or as otherwise specified, with a California modified split-spoon sampler that is lined with three six-inch brass tubes. The sampler and rod are inserted into the borehole to the current depth and a hammer of known weight and height above the sampler are allowed to free-fall onto the rod, advancing the assembly 18 inches into undisturbed soil. Clayton uses the number of blows necessary to drive the sampler into the ground to help evaluate the consistency of materials encountered. The sampler is then pulled from the borehole and disassembled, and the three brass tubes are separated for inspection and labeling.

Clayton uses new brass liners or liners cleaned with a trisodium phosphate (TSP) solution, double rinsed with clean tap water, and air dried prior to each sampling. The sampler is also cleaned with TSP and rinsed with tap water between sampling events.

Soil samples selected for laboratory analysis are left in the brass liners, sealed with aluminum foil and plastic caps, taped for air tightness, labeled, and immediately placed into a pre-cooled ice

chest chilled to less than 4°C. Labels contain the following information: site name, date and time sampled, borehole number and depth, and the sampler's initials. The samples are transported under chain-of-custody to a state-certified laboratory. The laboratory analyzes soil samples within the prescribed holding time, storing them at temperatures below 4°C at all times.

Pending results of laboratory analysis, excess drilling and sampling cuttings are placed into Department of Transportation (DOT)-approved drums, labeled with the name of the site, address, and well number, and left at the site. Uncontaminated soil may be disposed of by the client. Soil found to contain levels of contaminants above local or state action levels will require that the client dispose of it in accordance with hazardous waste regulations. At the client's request, we will assist with the disposal of contaminated soil.

WELL CONSTRUCTION

Boreholes are converted to monitoring wells by placing 2-inch or 4-inch diameter well casing with flush-threaded joints and slotted screen into the borehole. Construction materials include polyvinyl chloride (PVC), stainless steel, or low carbon steel. The most suitable material for a particular installation will depend on the parameters to be monitored. All screens and casings used are in a contaminant-free condition when placed in the ground. No thread lubrication is used, other than teflon tape, for connecting the casing segments.

Wells extend at least 10 feet into the upper saturated zone, but do not extend through any clay layers greater than 5 feet that are below the shallow water table. The standard practice for wells installed at hydrocarbon contamination sites is to construct a well with a 20-foot long perforated interval extending 15 feet below and 5 feet above the water table in an unconfined aquifer. The top of the well is solid casing. The annular space of the borehole is backfilled with washed, kiln-dried sand to a point at least 1 foot above the slotted screen. A seal above the filter pack is formed by placing a 1- to 2-foot layer of bentonite pellets on top of the sand. The bentonite pellets are moistened by pouring clean tap water down the hole so that they can expand and seal the annulus. A neat cement grout is placed above the bentonite seal and brought to the ground surface.

Well casings are protected from surface contamination, accidental damage, and unauthorized entry or tampering with water-tight locking caps on the well casings. The caps are usually surrounded by a concrete vault. Wells are clearly identified with a metal tag or other device where the following information is recorded: well number, depth to water, depth of well, casing data including location of screened interval.

WELL DEVELOPMENT

The well seal in newly developed wells must set up for 48 to 72 hours prior to development. Since development of the well can volatilize contaminants present, the well must also settle for at least 48 to 72 hours between development and the first purging/sampling incident.

All monitoring wells are initially developed to clean the well and stabilize sand, gravel, and disturbed aquifer materials around the screened internal perforations. Wells are developed by pumping (or bailing) and surging until water turbidity and specific conductance stabilize. In some cases, where wells are installed in low permeability formations and the wells purge dry, the well

is allowed to recover and is purged dry three times. Clean tap water is introduced into the well if it does not recover rapidly enough.

Pending results by laboratory analysis, purge water from well development and sampling is placed into DOT-approved drums, labeled with the name of the site, address, well number, and left at the site. Uncontaminated water may be disposed of by the client. Water found to contain levels of contaminants above local or state action levels requires that the client dispose of it in accordance with hazardous waste requirements. At the client's request, we can assist with the disposal of contaminated purge water.

GROUNDWATER SAMPLING

To collect a representative sample of the groundwater, stagnant water within the well casing and filter material must be purged and fresh aquifer water allowed to replace it. The water is purged from the well by pumping or bailing at least three well volumes. Well volumes are calculated by measuring depth to groundwater to the nearest 0.01 foot upon arrival at the well before any purging has begun. Groundwater samples are collected only after purging has been of sufficient duration for pH, temperature, and electrical conductivity to stabilize. When purging low-yield wells, the wells are purged to dryness. When the well recovers to 80% of the depth measured upon arrival, samples are collected.

Field sampling logs maintained for each well include:

- Monitoring well identification
- Static water level, before and after pumping
- Well depth
- Condition of water prior to purging (e.g., amount of free product)
- Purge rate and volume
- pH, temperature, and conductivity during purging
- Time purged
- Time of sample collection
- Sampling method
- Name of sampler
- Climatic conditions

Water samples are collected using clean teflon bailers. All equipment that contacts samples is thoroughly cleaned before arrival at the site and between sampling events.

Water is collected in clean laboratory-supplied containers, labeled, placed immediately into an ice chest pre-cooled to 4°C, and transported to Clayton's laboratory for analysis. One trip blank will be furnished in accordance with our quality assurance/quality control (QA/QC) program.

All samples are collected in such a manner so as to minimize the volatilization of a sample due to agitation and/or transfer from bailer to sample container. Samples are collected so that contaminants most sensitive to volatilization are sampled first.

Preservatives are not added to any sample, unless instructed. If requested, they are supplied by Clayton's laboratory.

All sample containers are labeled in the field. Labels contain the following information: project name, sample identification number, project number, date and time of collection, and sampler's initials.

Under no circumstances are sealed sample containers opened by anyone other than the laboratory personnel who perform the requested analyses. If it is necessary for samples or sample chests to leave the immediate control of the sampler prior to delivery to the laboratory, for example during shipment by an overnight shipper, a custody seal is placed on each sample container and/or sample chest to ensure that the samples have not been tampered with during transportation. The custody seal is signed by the sampler, and the date and time that the seal was placed is recorded. The elapsed time between sample collection and delivery to the laboratory never exceeds 48 hours. Water samples are not held for more than 14 days prior to analysis and are kept at 4°C at all times.

To document and trace samples from time of collection, a signed chain-of-custody record is filled out by the sampler and accompanies the samples through the laboratory analyses. The completed chain-of-custody is included with the analytical report from the laboratory.

REFERENCES

Groundwater Monitoring Guidelines, Revised February 1990. Alameda County District Groundwater Protection Program.

Leaking Underground Fuel Tank (LUFT) Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Tank Closure, May 1988. State of California LUFT Task Force.

Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks, Revised November 1989. North Coast, San Francisco Bay, and Central Valley regions of the California State Water Quality Control Board.

Standards for the Construction and Destruction of Wells and Other Deep Excavations in Santa Clara County, Revised June 1989. Santa Clara Valley Water District.