SITE CHARACTERIZATION REPORT FOR SOIL AND GROUNDWATER CONTAMINATION AT 1600-63RD STREET SITE, EMERYVILLE, CALIFORNIA

PREPARED FOR

WAREHAM DEVELOPMENT GROUP
San Rafael, California

PREPARED BY

ENGINEERING-SCIENCE
DESIGN • RESEARCH • PLANNING
600 BANCROFT WAY, BERKELEY, CALIFORNIA 94710 • 415/548-7970
OFFICES IN PRINCIPAL CITIES

DECEMBER 1988

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ES Project No. NC065.14

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Attn: Mr. Refat Shahid

Re: Final Site Characterization Report

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(415) 548-7970

22 December 1988
Ref: NC065.14

Mr. Mark Scher
Wareham Development Group
1120 Nye Street, Suite 400
San Rafael, CA 94901

Subject: Final Site Characterization Report for 1600-63rd Street Site in Emeryville, California

Dear Mr. Scher:

The enclosed report describes all site characterization activity conducted at the 1600-63rd Street Site in Emeryville by Engineering-Science (ES) for Wareham Development Group. This final report follows the first phase of site characterization activity begun in September 1987, and described in a letter report to Wareham Development in October 1987. Pertinent information contained in the preliminary report has been synthesized into this report to provide a document which evaluates all data collected to date.

This report includes a site description, a history of ownership and activity at the site, and a description of the site's hydrogeologic setting. Characterization activity described includes borehole drilling and soil sampling, underground storage tank investigation, monitoring well installation and sampling, above ground storage tank investigation, sump sampling and content disposal, and water well closure. Site remediation activities described include underground storage tank closures, and the excavation and treatment of contaminated soils.

Recommendations are made at the conclusion of the document for additional site characterization activity which ES feels is warranted by the levels of contamination encountered in the soil and groundwater at the site.

Engineering-Science appreciates the opportunity to be of service to the Wareham Development Group. Please call if you wish to discuss the contents of this report.

Very truly yours,

Dan B. McCullar, R.G.
Project Manager

Richard S. Makdisi, Manager
Hazardous Waste Management
Department

T. G. Cole, Vice President
Principal in Charge

DBM/dae/108-16.R3

cc: Alameda County Health Department
Regional Water Quality Control Board

SITE CHARACTERIZATION REPORT FOR SOIL AND GROUNDWATER CONTAMINATION AT 1600-63rd STREET SITE EMERYVILLE, CALIFORNIA

Prepared for

WAREHAM DEVELOPMENT GROUP
San Rafael, California

December 1988

Prepared by

ENGINEERING-SCIENCE
600 Bancroft Way
Berkeley, California 94710

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SECTION 1
INTRODUCTION

This report describes the implementation of Phase II of the site characterization for hazardous materials in soil and groundwater at the 1600-63rd Street site in Emeryville, California. This work is based on recommendations outlined in the Preliminary Report for Environmental Assessment of the Peterson Manufacturing Parcel submitted to Wareham Development in October 1987, and requirements for additional site assessment based on contamination encountered at the site during the course of the project.

Site characterization activity consisted of six discrete tasks, conducted concurrently and prioritized in order to minimize delays in the construction schedule. These tasks included 1) borehole sampling and analysis of soils, 2) underground storage tank investigation, 3) monitoring well installation and sampling, 4) above ground storage tank investigation, 5) sump sampling for content disposal, and 6) water well closure. Task 1 and the initial steps of Task 2 (sampling of the underground storage tank contents) were described in the Preliminary report dated 15 October 1987. These tasks are summarized in this document for continuity.

SITE DESCRIPTION

The 1600-63rd Street site is a roughly rectangular parcel located along the east side of the Southern Pacific Railroad (SP) right-of-way between 63rd and 64th Streets in Emeryville, California. The parcel covers approximately 2.75 acres, and measures approximately 245 feet north to south by approximately 485 feet east to west. The site is

bounded on the west by Overland Avenue and the SP right-of-way, on the north by 64th Street, on the south by 63rd Street and on the east by the Emeryville Fire Station at the corner of 63rd Street and Hollis. A site location map is shown in Figure 1-1.

The site is essentially flat but slopes gradually to the west toward San Francisco Bay. The elevation of the site varies from approximately 15 feet above mean sea level along the eastern boundary to approximately 10 feet above mean sea level along Overland Avenue to the west (Reference 1).

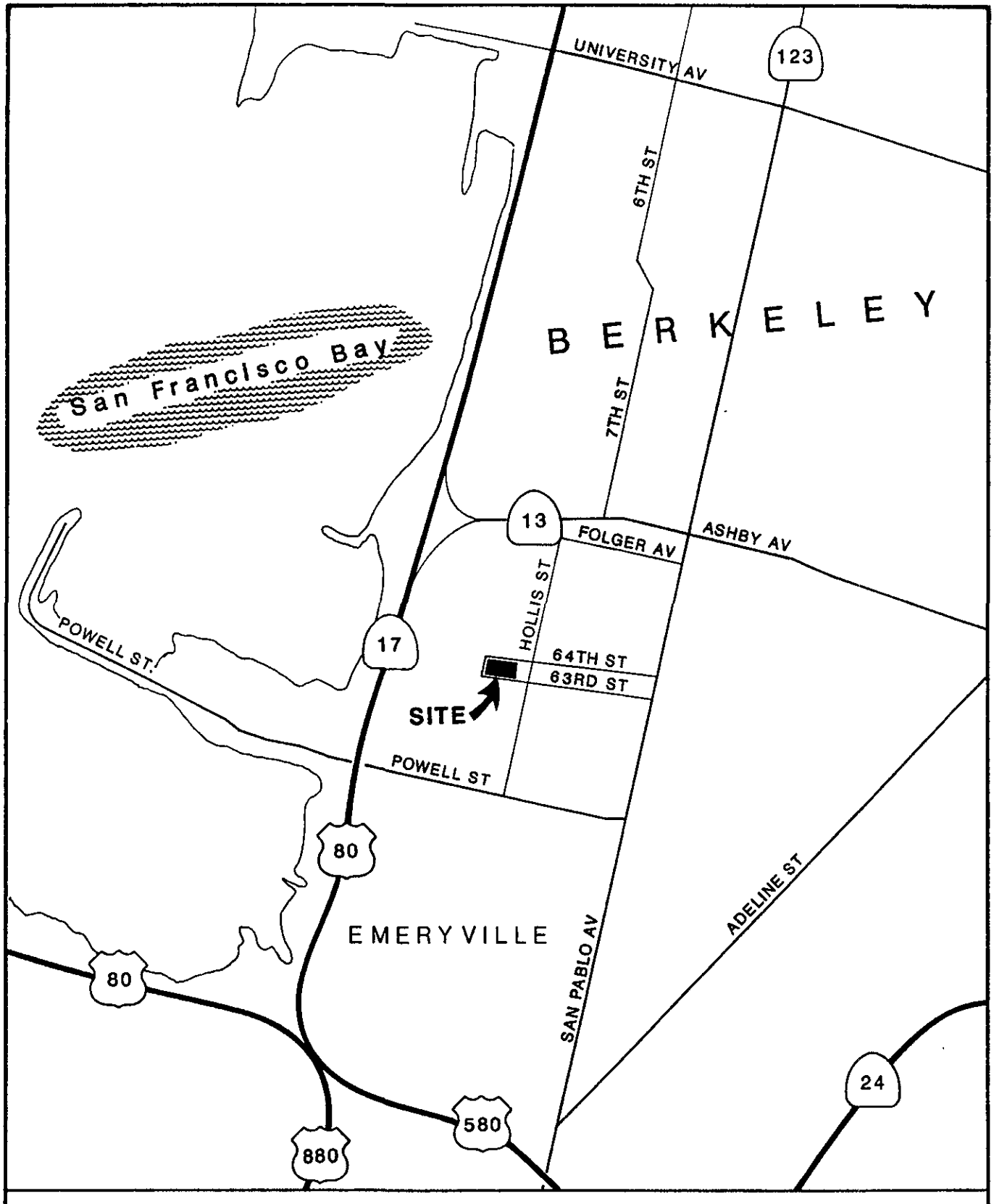
The surrounding area contains an aging industrial core which is slowly being transformed into office, light industrial, commercial, and multi-family residential.

SITE HISTORY

The 1600-63rd Street parcel was purchased by Mr. Adolph Peterson in the early 1900s (Reference 2). At that time the parcel was located along the edge of the Emeryville shoreline. Property which is now west of the SP right-of-way was in the tidal plain of San Francisco Bay until construction of the East Shore Highway in 1954. The City of Emeryville filled the low-lying sites, newly protected by the freeway, in the late 1950s. Fill materials probably consisted of clayey/sandy clean fill, building scrap and refuse as well as some industrial wastes (Reference 3). It is unclear as to the extent of artificial fill emplacement at the 1600-63rd Street site, although it appears to have been minor relative to properties west of the SP right-of-way.

By 1914, Mr. Peterson had constructed the Peterson Manufacturing Company, a tallow manufacturing plant, on the subject parcel. The manufacturing process rendered the bodies of animals into fats and oils used to manufacture the tallow. Hexane, which was stored in an underground storage tank on the property until recent years, and possibly other solvents were used in the process. The plant operated continuously for over seventy years, with numerous modifications. In 1987 the plant was

FIGURE 1-1



LOCATION MAP

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shut down and the site purchased by the Wareham Development Group (Wareham), a development consortium (Reference 2).

By late 1987, Wareham Development began to dismantle the old manufacturing plant to construct a Federal Express transfer facility. The Federal Express facility was scheduled for completion in October 1988.

OBJECTIVES AND SCOPE OF WORK

Engineering-Science was contracted by Wareham Development to collect soil samples and install monitoring wells to investigate possible environmental contamination from four underground storage tanks on the property. As the demolition of the plant proceeded, the investigation of underground sumps; the sampling and testing of the contents of above ground storage tanks; the investigation, sampling and closure of a 320-foot water well; and the excavation monitoring and landfarm remediation of hydrocarbon contaminated soil was added to the contracted scope of work.

SECTION 2
HYDROGEOLOGIC SETTING

The hills above Emeryville and along the San Francisco Peninsula, as well as the downwarped bay plain in between, are part of the central California Coast Range Province. These topographic features resulted from repeated episodes of folding and faulting over the last three million years.

The rock exposed in the hills and underlying the recent sedimentary deposits of the bay plain consist of Tertiary aged sediments and volcanic rock overlying Jurassic to Cretaceous aged bedrock of the Franciscan formation. The uplift of the hills resulted in erosion and deposition of a thick layer of porous alluvial fan deposits on the bay plain along their western flank. Approximately 540 feet of Tertiary to Early Quaternary sediment overlies bedrock beneath Emeryville (Reference 4).

The oldest alluvial fan deposits are known as the Alameda formation, which are overlain by approximately 10 feet of alluvium and stream deposited sands and silts of the Temescal formation. The Temescal formation is overlain by up to 30 feet of the fine-grained, primarily wind deposited, Merritt sand. West of the SP right-of-way, the Merritt sand is overlain by up to 20 feet of younger bay mud--a fine-grained, clay rich deposit resulting from the melting glaciers and rising sea level at the end of the last ice age. On the project site itself, bay mud deposits are thin to absent (Reference 4).

Borehole logs indicate a haphazard and varied near surface lithology over the west end of the site where artificial fill emplacement is most likely to have occurred. During the course of the investigation, several "burn pit" areas of unknown size, consisting of partially burned

and decomposing wood and refuse were uncovered beneath the western third of the parcel. This material is most likely to have been emplaced during the operation of the tallow manufacturing plant.

GROUNDWATER HYDROLOGY

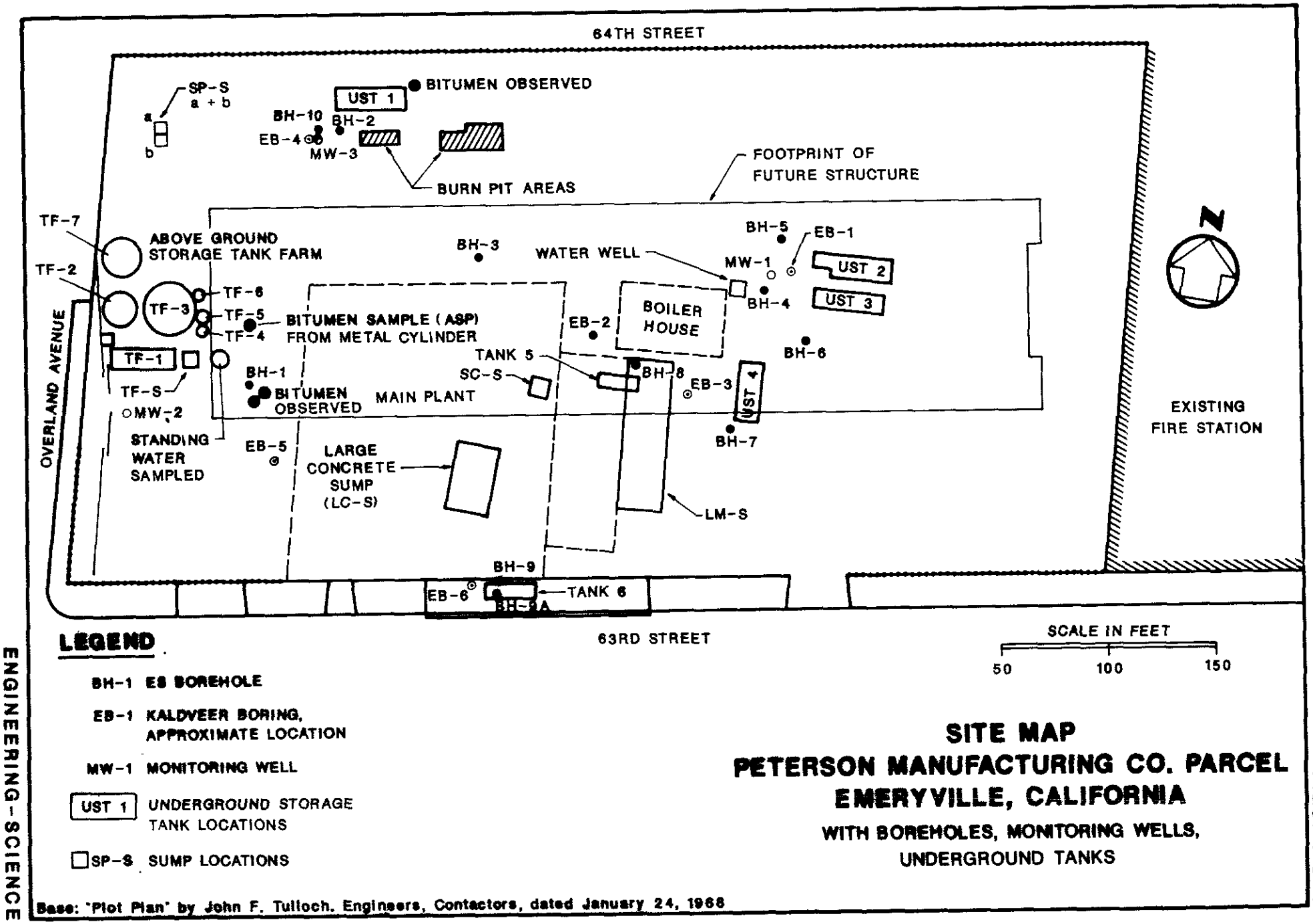
Fresh water aquifers beneath Emeryville include most of the porous sands and gravels of the Alameda and Temescal alluvial deposits, and the Merritt Sand. The aquifers are recharged by rainfall on exposed areas of the porous formations, primarily between the SP right-of-way and the hills to the east. The water flows downward until it reaches the groundwater surface or a relatively impermeable boundary then flows down gradient toward the bay. In most of the shallower formations, the fresh water contacts higher density salt water in the vicinity of the bay margin (Reference 3).

The regional groundwater flow direction is westward toward the bay, although local variations probably occur due to variations in topography and subsurface lithology. The direction of groundwater flow at the Peterson site is probably also to the west. The depth to groundwater is approximately six feet below the ground surface, although areas of perched groundwater have been encountered at approximately three feet in the burn pit areas encountered beneath the western third of the site.

SECTION 3
SITE CHARACTERIZATION

Initial site characterization activity was conducted at the site in December 1986 and February 1987. The earlier study included a site history investigation and a description of the manufacturing plant facilities and processing activities (Reference 5). The later study involved a subsurface investigation by means of six boreholes to depths of 5, 5, 10, 12.5, 13.5, and 16 feet. Appropriate samples were collected and analyzed for waste oil (three samples), diesel fuel (one sample), and volatile organic compounds (one sample). Significant concentrations of waste oil, gasoline, diesel, and oil and grease were identified (Reference 6). The locations of the initial site characterization boreholes are shown in Figure 3-1.

Engineering-Science (ES) continued the site investigation activities in September 1987, at approximately the same time that demolition of the plant facility was initiated. Site characterization activities conducted by ES include additional borehole sampling and analysis, an underground storage tank investigation and closure, monitoring well installation and sampling, above ground storage tank investigation and sampling, sump content sampling, and a water well investigation and closure. The locations in which the site characterization activity was focused are shown on the site map in Figure 3-1.



LEGEND

BH-1 ES BOREHOLE

EB-1 KALDVEER BORING, APPROXIMATE LOCATION

MW-1 MONITORING WELL

UST 1 UNDERGROUND STORAGE TANK LOCATIONS

SP-S SUMP LOCATIONS

Base: 'Plot Plan' by John F. Tulloch, Engineers, Contactors, dated January 24, 1968

SITE MAP
PETERSON MANUFACTURING CO. PARCEL
EMERYVILLE, CALIFORNIA
WITH BOREHOLES, MONITORING WELLS, UNDERGROUND TANKS

FIGURE 3-1

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BOREHOLE DRILLING AND SOILS INVESTIGATION

Twelve soil borings were completed by ES at the site on 2, 8 and 9 September 1987. Based on borehole data acquired during the previous site investigation, ten borehole locations were selected to characterize contamination presumed to result from leakage of underground fuel storage tanks (USTs). The locations of the boreholes are shown on the site map in Figure 3-1.

Borehole BH-1 was located away from any known UST or potential source of contamination to provide a background contaminant level for the site vicinity. Borehole BH-3 was located in an area believed contaminated only by animal fat to determine potential contaminant levels directly attributable to tallow manufacturing. Of the twelve borings, two were abandoned (BH-2 and BH-9) due to drilling refusal in the first several feet. The ten other borings were drilled to a maximum depth of eleven feet.

The soil borings were drilled using a hand-held, gas-driven hammer sampler. The hammer drives a 1.25-inch outside diameter (OD) steel casing lined with 1-inch OD brass sampling tubes to desired sampling depths. This sampling technique is advantageous as it allows continuous, reliable sampling of undisturbed soils. Soil samples showing greatest evidence of contamination (i.e., stains, odors) were selected for analysis. The selected samples were capped with aluminum foil, taped, labeled, refrigerated in an ice chest, and transported to the State-Certified ES Berkeley laboratory for analysis.

Chain-of-custody records and laboratory analysis reports are presented in Appendix A. Soil boring logs are presented in Appendix B.

Tarry Bitumen Investigation

During the week of 2 May 1988, earth moving equipment uncovered a collection of metallic refuse, including several small cylindrical containers. A black tarry bitumen exhibiting plastic flow during warm weather was observed flowing from one of the containers. Minor deposits of similar material were also observed approximately one foot below the

ground surface at the northeast end of UST-1. A sample of the tarry material was collected from one of the metal cylinders at a location west of the main plant (Figure 3-1). This was submitted for analysis for lead, total petroleum hydrocarbons, volatile organic compounds (by EPA method 8240); PCBs (EPA Method 8080); and base neutral and polynuclear aromatic (PNA) compounds (EPA Method 8270).

Composite Surface Soil Sampling

During the final stages of site preparation prior to the start of construction, a composite soil sample was collected from the surface in order to identify options for disposal of graded surface materials. Samples were collected in a bucket using a hand trowel, on an approximately 100-foot grid at depths ranging from 3 to 6 inches. The samples were composited on site, scooped into a mason jar, and submitted to a State-certified laboratory for analysis by GC/FID for total petroleum hydrocarbons, by EPA methods 8240 for volatile organic compounds, 8080 for PCBs, and ICAP for heavy metals.

UNDERGROUND STORAGE TANK INVESTIGATION

Six underground fuel and/or solvent storage tanks (USTs) were known to exist at the Peterson Manufacturing site (Figure 3-1). UST-1 was located near the northwestern corner of the property, east of the solvent recovery plant. This tank reportedly contained solvents (most recently hexane) until diesel fuel was transferred to it from UST-4 in mid-1986 (Reference 7).

UST-2 was located adjacent to and north of UST-3, east of the fuel island near the center of the property. UST-2 is believed to have contained No. 2 diesel fuel, and UST-3 is believed to have contained either gasoline or diesel, presumably for use in the plant vehicles. UST-4 stored heating oil and was located south of the boiler room approximately 40 feet southwest of USTs 2 and 3. UST-5 was located at the northeastern end of the machinery enclosure and southwest of the boiler room. This tank reportedly contained boiler fuel, and was excavated in approximately 1963. UST-6 was located southeast of the main

plant. This tank reportedly contained gasoline and was excavated in the mid 1970s (Reference 2).

The contents of the four remaining USTs (1-4) were sampled on 18 September 1987. Samples of the tank contents were retrieved from the tanks using glass jars tied onto the ends of string and lowered through the fill pipe into the tanks. All four tanks contained liquid to a depth of not more than approximately one foot. Once retrieved from the tank, samples were poured into 40 ml glass VOA (volatile organic analysis) vials and capped with teflon-lined lids. The samples were labeled, refrigerated and transported to a State-certified laboratory for analysis.

The sample recovered from UST-1 was described as a watery brown sludge which separated into layers after sampling. UST-2 contained an amber colored, viscous petroleum-like liquid. Both the tank lid and adjacent fuel pump were labeled "Diesel #2". Two access holes were encountered to UST-3, but only one could be opened. The sample recovered from the tank was described as an amber liquid, similar to that recovered from UST-2. There was no associated pump remaining at the adjacent fuel island. UST-4 contained a very dark petroleum fuel oil, with a strong odor. The tank lid was observed to be encrusted with streaks of animal fat.

The sample chain-of-custody records and laboratory analytical reports are contained in Appendix A.

MONITORING WELL INSTALLATION AND SAMPLING

Borehole samples collected in January 1987 from the fuel island area (EB-1) and the area west of the main plant (EB-5) were found to contain total petroleum hydrocarbons at levels exceeding 1,000 parts per million (ppm) (Reference 5). Samples collected by Engineering-Science in October 1987 from the fuel island area (BH-4 and BH-5) and west of the main plant (BH-1) also contained total petroleum hydrocarbons at concentrations exceeding 1,000 ppm (Reference 2).

Five monitoring wells were recommended by ES (Reference 2) to investigate the potential for groundwater degradation resulting from elevated levels of hydrocarbons in soils at the following locations: boreholes BH-4 and 5 (near UST-2); borehole BH-1; borehole EB-4, west of UST-1; borehole EB-3, west of UST-4; and borehole EB-6, west of UST-6. An agreement was reached with Wareham Development for the installation of three sacrificial wells at locations where the potential for groundwater quality degradation could best be evaluated. The selected locations were: 1) midway between boreholes BH-4 and 5 (MW-1); 2) at the far west and presumed downgradient end of the site (MW-2); and 3) at borehole EB-4 (MW-3) to investigate the nature of the dark oil product reported floating on the groundwater (Reference 2). These well locations are shown in Figure 3-1.

Monitoring Well Installations

The three monitoring wells, MW-1, MW-2, MW-3, were constructed in November 1987, according to procedures established by the California Department of Water Resources (DWR) and the California Regional Water Quality Control Board (RWQCB).

Each well bore was drilled using an 8-inch outside diameter (OD) continuous flight, hollow stem auger. Soil samples were collected during well installation using a California modified split spoon sampler. Samples were selected for analysis based on visual and olfactory evidence of contamination. Samples were analyzed for petroleum hydrocarbons and for chemicals which had been identified in nearby underground storage tanks or in soil samples previously collected at nearby locations on the project site.

The wells were constructed using threaded 10-foot lengths of 2-inch inside diameter (ID) schedule 40 PVC casing. Organic solvents were not used. Each well was screened using 2-inch ID schedule 40 PVC casing with 0.010-inch factory milled slots from the groundwater surface to the bottom of the well. A PVC bottom plug was placed at the base of each casing string.

A gravel pack of Monterey Sand No. 3 was emplaced in the annular space surrounding the slotted casing from the bottom of each well to approximately two feet above the top of the slotted section. The remaining annular space from the top of the sand pack to the ground surface was grouted using a 5 percent bentonite cement. A lockable well cap was installed to enclose each of the well heads, and to protect the well from surface water entry, accidental damage, unauthorized access, and vandalism.

Monitoring Well MW-1. Monitoring well MW-1 was installed approximately 20 feet west of UST-2 on 5 November 1987. The well was drilled to a depth of 24.7 feet, and was screened from the bottom of the hole to 7 feet below ground surface (BGS). The sand pack was emplaced in the annular space from 6 feet BGS to the bottom of the hole. A bentonite pellet seal was added to the top of the sand column from 6 feet to 4.5 feet BGS. Soil samples were collected, at a depth of 5 feet (MW-1,5) and from between 10.5 and 11 feet (MW-1,10). Sample MW-1,5 was submitted to a State-certified laboratory for analysis for tetraethyl lead, by modified EPA method 8015 for total fuel hydrocarbons with extended analysis for benzene, toluene, and total xylenes, and by DHS method AB 1803 for ethylene dibromide.

Well MW-1 was developed on 12 of November 1987 by bailing approximately 40 gallons of water from the well. The development water was described as having a gasoline or diesel odor and displayed a visible oil slick on its surface. After the well was developed, a sample of the groundwater was collected according to EPA sampling protocol and submitted for analysis for tetraethyl lead, by modified EPA method 8015 with extended analysis for benzene, toluene and total xylenes, and by DHS method AB 1803 for ethylene dibromide.

Monitoring Well MW-2. Well MW-2 was installed at the west end of the Peterson property just south of the above ground storage tank farm on 6 November 1987. The well was drilled to a depth of 24.8 feet, and was screened from the bottom of the well to 6 feet BGS. The sand pack was emplaced in the annular space from the bottom of the well to 4.8 feet BGS. A bentonite pellet seal was added to the top of the sand column

between 3.5 and 4.8 feet BGS. The remaining annulus was grouted to the surface using 5 percent bentonite cement.

Soil samples were collected according to sampling protocol during the installation of MW-2 at a depth of 5 feet (MW-2,5) and from between 10.3 feet and 8.6 feet (MW-2,9). Sample MW-2,5 was submitted for analysis by EPA methods 503A and E for oil and grease, and modified 8015 for total fuel hydrocarbons. Well MW-2 was developed on 9 November 1987 by bailing approximately 36 gallons of water from the well. The bailed water had no odor but was turbid and viscous during development. No oil slick was observed on the water in the drum. Water samples were collected from well MW-2 according to sampling protocol on 12 November 1987. These samples were submitted for analysis by EPA methods 503A and E for oil and grease, and modified 8015 for total fuel hydrocarbons.

Monitoring Well MW-3. Well MW-3 was installed approximately 35 feet southwest of UST-1 on 6 January 1988 to a depth of approximately 21.5 feet. During the site investigation of February 1987, a black oily substance was reported on top of shallow (6 feet BGS) groundwater in borehole EB-4 at this location (Reference 6). During the installation of the well, groundwater rose up to the ground surface. To ensure that the well completion would allow for the determination of product thickness, the well was constructed using 0.020-inch slotted 2-inch schedule 40 PVC casing from the bottom of the hole to the ground surface. Monterey No. 3 sand pack was emplaced from the bottom of the well to the ground surface.

Soil samples were collected from the well MW-3 borehole at a depth of 4.5 feet (MW-3,4.5), from between 6.5 and 8 feet (MW-3,6.5), between 11 and 12.5 feet (MW-3,11), between 15 and 16.5 feet (MW-3,15), and between 20 and 21.5 feet (MW-3,20). Sample MW-3,4.5 was submitted for analysis by EPA method 8240 for volatile organic compounds, 8080 for PCBs, and modified 8015 for total fuel hydrocarbons.

Well MW-3 was developed on 8 January 1988 by pouring in 15 gallons of water and then bailing 25 gallons from the well. The bailed water was clear with no sheen or free floating product. The well was sampled on 13 January 1988 after bailing 10 gallons of water (3 to 5 casing volumes) from the well. The samples were analyzed by EPA method 608 for PCBs,

modified EPA method 8015 for total petroleum hydrocarbons (using gas chromatography with a flame ionization detector [GC/FID] with a diesel/oil standard), and EPA method 624 for volatile organic compounds.

Laboratory analytical reports and chain-of-custody records are contained in Appendix A. Well logs showing the completion details and sampling intervals for each of the wells are contained in Appendix B.

Because the locations of wells MW-1 and MW-3 would interfere with soil remediation and construction activities at the site, they were abandoned on 11 February 1988. The well abandonments did not occur under Engineering-Science supervision, but were abandoned by Datum Engineering according to ES specifications supplied to Plant Reclamation (Reference 8).

ABOVE GROUND STORAGE TANK SAMPLING

Seven above ground storage tanks (ASTs) ranging from 850 to 36,000 gallons in size were located on the Peterson Manufacturing site as shown in Figure 3-1. The contents of the tanks were sampled during three sampling events on 1 and 24 March, and 1 April 1988. A pool of standing water in the tank farm area was sampled and submitted for analysis on 1 March 1988.

Tank Sampling Procedures

Tanks containing semi-solid to solid materials were sampled using clean trowels to transfer the material into mason jars. In each case the jar was filled completely to the top to minimize head space. Tanks containing liquid materials were sampled by dipping clean glass mason jars on the ends of string into each of the tanks. Sufficient material was transferred from the sampling jars into clean mason jars to minimize head space. The samples were labeled, refrigerated and transported to a State-certified laboratory for analysis. Laboratory analytical reports and chain-of-custody records are presented in Appendix A.

Tank AST-1. Tank AST-1 was an approximately 20,000-gallon horizontal cylindrical tank, approximately 28 feet long by 11 feet in

diameter. The tank contained a white to gray solid, congealed fatty substance which covered the bottom 0.40 feet of the tank. Sample TF-1 was submitted for laboratory analysis of moisture content, and for analysis by EPA method 418.1 for total petroleum hydrocarbons, EPA method 8240 for volatile organic compounds, and EPA method 413.2 for total oil and grease.

Tank AST-2. Tank AST-2 was an approximately 30,000-gallon vertical cylinder tank measuring approximately 15 feet tall and 18 feet in diameter. The tank contained a yellow-black semi-solid material with a discrete black liquid phase, measuring approximately 0.75 feet deep at the bottom of the tank. A sample of semi-solid material (TF-2) was submitted for analysis by EPA method 418.1 for total petroleum hydrocarbons, and EPA method 8240 for volatile organic compounds.

Tank AST-3. This tank was an approximately 36,000-gallon vertical cylindrical tank measuring approximately 12.5 feet tall and 22 feet in diameter. The tank contained a dark red-brown semi-solid to solid material measuring approximately 0.2 feet deep at the bottom of the tank. Sample TF-3 was submitted for analysis by EPA method 418.1 for total petroleum hydrocarbons, and EPA method 8240 for volatile organic compounds.

Tank AST-4. Tank AST-4 was a tall narrow vertical cylinder measuring approximately 12 feet high and 5 feet in diameter, with a capacity of approximately 1,800 gallons. The tank contained about 1,200 gallons of a black liquid measuring approximately 8 feet deep. Sample TF-4 was submitted for analysis by EPA method 418.1 for total petroleum hydrocarbons, EPA method 624 for volatile organic compounds, and EPA method 413.2 for total oil and grease.

Tank AST-5. Tank AST-5 was a black, relatively small (approximately 850 gallons) vertical cylindrical tank with a conical bottom. The tank cylinder measured approximately 6 feet high and 5 feet in diameter. The depth of the conical bottom measured approximately 3 feet from the base of the cylinder to the point. The tank was approximately half full of a light yellow semi-solid material, which was sampled and submitted for analysis by EPA method 418.1 for total

petroleum hydrocarbons, and EPA method 8240 for volatile organic compounds.

Tank AST-6. Tank AST-6 was a vertical cylindrical tank measuring approximately 12 feet high and 5 feet in diameter. The tank was empty except for iron-oxide flakes which were not submitted for analysis.

Tank AST-7. Tank AST-7 was a vertical cylindrical tank measuring approximately 12 feet high and 10 feet in diameter. The tank contained a gray-black sludge with a brown crusty surface. Sample TF-7 was submitted for measurement of moisture content, and for analysis by EPA method 418.1 for total petroleum hydrocarbons, EPA method 8240 for volatile organic compounds, and EPA method 413.2 for total oil and grease.

Standing Water. A pool of standing water near AST-1 was sampled and submitted for analysis by EPA methods 413.2 for total oil and grease, 418.1 for total petroleum hydrocarbons, and 8240 for volatile organic compounds.

SUMP CONTENT SAMPLING

Five subsurface sumps were located on the Peterson Manufacturing parcel as shown in Figure 3-1. The contents of the sumps were sampled during five discrete sampling events on 1, 16, 22 and 24 March, and 7 April 1988.

Sump Sampling Procedures

Liquid samples were collected from the sumps by lowering sampling containers, such as VOA vials and one-liter plastic bottles, directly into the liquid, or by first lowering a clean glass jar into the liquid and transferring it into appropriate sampling containers. Laboratory analytical reports and chain-of-custody records are presented in Appendix A.

Sump TF-S. Located 10 feet east of AST-1, the tank farm sump was constructed of concrete and measured 2.7 feet by 2.7 feet by 1 foot deep. The sump contained a gray liquid with sediments and a floating lumpy

component. Sample TF-S was submitted for analysis by EPA method 413.2 for total oil and grease, EPA method 418.1 for total petroleum hydrocarbons, and EPA method 624 for volatile organic compounds.

Sump SC-S. Constructed of concrete and located inside the main plant building, sump SC-S measured 4 feet by 4 feet, by 1.5 feet deep. The sump contained a dark liquid with a surface scum. Sample SC-S was submitted for analysis by EPA method 413.2 for total oil and grease, EPA method 418.1 for total petroleum hydrocarbons, and EPA method 624 for volatile organic compounds.

Sump SP-S. Located inside the solvent plant, this concrete sump was constructed in two compartments. The south compartment (a) measured 6 feet by 4 feet, by 2 feet deep. The smaller north compartment (b) measured 1.5 feet by 4 feet by 2 feet deep. Sample SP-Sa consisted of a dark liquid with floating lumps. Sample SP-Sb consisted of a dark liquid with floating lumps and abundant green algae. Both samples were submitted for analysis by EPA method 413.2 for total oil and grease, EPA method 418.1 for total petroleum hydrocarbons, and EPA method 624 for volatile organic compounds.

Sump LC-S. Located inside the main plant building, this large concrete sump measured 43 feet by 20 feet, by 10 feet deep. The sump contained a light-colored liquid with an oily film on the surface. Sample LC-S was submitted for analysis by EPA method 413.2 for total oil and grease.

Sump LM-S. A large metal trough measuring 55 feet by 9 feet, by 9.5 feet deep was located along the east side of the main plant building. The trough was filled with a grey liquid with a strong odor of animal fat. Samples were collected from various depths. Sample LM-Sa was collected from the surface, sample LM-Sb was collected from a depth of 3.5 feet, and sample LM-Sc was collected from the bottom of the trough. The bottom sample contained a minor amount of black sediment. All three samples were submitted for analysis by EPA method 413.2 for total oil and grease.

WATER WELL INVESTIGATION

The site characterization report dated December 1986 mentioned the existence of a 60 foot deep water well at the northeast corner of the boiler house (Reference 5). The location of the well is shown in the site map in Figure 3-1.

On 24 February 1988, an oil lubricated vertical line shaft pump was removed from the top of the well casing by DeLucchi Well and Pump, Inc. Along with the pump, approximately 190 feet of pipe, reported to have been coated with diesel, was also removed from the well. According to John DeLucchi the oil was not the type used in oil lubricated pumps, but was less viscous and smelled more like diesel (Reference 9). The bottom of the well was estimated to be 350 feet deep (Reference 10).

The well was sampled by DeLucchi using a can at the end of a string. The can is reported to have been covered with petroleum hydrocarbon fuel when withdrawn from the well. A sample was submitted to a State-certified laboratory for analysis by modified EPA method 8015 for total petroleum hydrocarbons. The results confirmed (petroleum) hydrocarbons present at 17,000 parts per million. The laboratory analytical report is included in Appendix A.

In mid-March 1988, Plant Reclamation proceeded with the demolition of the Main Plant building and adjacent boiler house. Unfortunately, steps were not taken to protect the well, therefore during the demolition of the neighboring buildings, bricks, wood and assorted rubble completely blocked the upper several feet of casing and prevented access to the well.

The well was opened to a depth of 90 feet by Plant Reclamation on 5 April 1988. On 6 April, Engineering-Science measured the thickness of the floating product in the well (using an oil/water interface probe) and found it to be 24 feet thick, with its surface 12 feet below the ground surface. Plant Reclamation arranged for the oil to be pumped out and hauled off-site for disposal on 8 April 1988.

ES contracted with Maggiora Brothers Drilling to clear the well to a total depth, take an accurate measurement of the depth, run a video inspection of the well, and close the well according to Regional Water Quality Control Board specifications. The well was cleared on 4 May 1988, by jetting water into the well casing from a rotary drill bit. The rotary and jetting action cleared the well casing sufficiently but resulted in approximately 1,500 gallons of water (potentially contaminated) being directed into a nearby tank excavation (UST-2) already flooded with groundwater seepage. The water was immediately pumped out of the excavation and into two 6,500-gallon temporary storage tanks ordered to the site to accommodate the well purge water. Thereafter, water jetted from the well was diverted into a shallow excavation and pumped directly into storage tanks. The rotary drill stem tagged the bottom of the well and determined the actual well depth to be 322 feet.

A video record of the well was made by Water Well Specialties, Inc. on 11 May 1988. The steel casing of the well appeared intact, with perforations clearly visible sporadically from 72 to 113 feet, 134 to 166 feet, and 195 to 227 feet below the ground surface. Below 260 feet, the water was very cloudy and perforations difficult to discern. It is assumed that the gravel pack extended the entire length of the casing. The video record log is presented in Appendix C.

Water samples were collected from the well at discrete depth intervals on 11 May 1988 using inflatable packers to isolate zones of perforations identified on the video log. Sample WW1-90 was collected from between 80 and 90 feet below the ground surface (BGS), sample WW1-150 was collected from between 145 and 155 feet BGS, and sample WW1-300 was collected from below 290 feet BGS.

Approximately 13,000 gallons of water was purged from the well during well clearing activity, and was stored in two 6,500-gallon Baker storage tanks. Disposal of the purge water depended upon the concentrations of contaminants identified in water samples collected from the well. Samples were collected from Baker tanks A and B (BT-A and BT-B) and submitted for analysis by EPA methods 602 for aromatic volatile

organics, 608 for PCBs, modified 8015 for total fuel hydrocarbons and for 13 priority pollutant metals.

Laboratory analytical reports and chain-of-custody records are included in Appendix A.

SECTION 4
RESULTS AND DATA INTERPRETATION

Hazardous materials contamination has been identified in soil and groundwater at the 1600-63rd Street site at concentrations requiring site remediation and additional study. Petroleum hydrocarbon contamination has been identified in soils associated both with the storage of fuels in underground tanks, and as yet unidentified sources in random locations. Other soil contaminants thus far identified at the site include volatile organic compounds, PCBs, and polynuclear aromatic compounds.

Hazardous materials contamination has also been identified in groundwater beneath the site. Like the soil contaminants identified, these include petroleum hydrocarbons, volatile organic compounds, PCBs and polynuclear aromatic compounds.

BOREHOLE DRILLING AND SOILS INVESTIGATION

Total petroleum hydrocarbon contamination has been identified at concentrations exceeding regulatory agency action levels (1,000 ppm) in soil samples from boreholes BH-1, BH-4, BH-5, EB-1, and EB-5. These locations are shown on Figure 3-1.

A summary of analytical results for all borehole drilling and soil samplings are presented in Table 4-1. Laboratory analytical reports and chain-of-custody records are included in Appendix A.

Tarry Bitumen Investigation

This material was found to contain 43,000 ppm total petroleum hydrocarbons, 440 ppm lead, and various polynuclear aromatic compounds

Table 4-1
Analytical Results of Borehole and Miscellaneous Soil Samples
Wareham Development, Peterson Manufacturing Parcel

Sample ID (a,b)	Depth (ft)	Sample Description	Analyses Performed	Analytical Results	Date Sampled
BH-1 (composite)	2.5 6.5	Green-black clay Black and orange gravel; strong hydrocarbon odor	418.1 - TPH 413.2 - O&G	1,900 mg/kg 4,800 mg/kg	9/2/87
BH-2	None	Drilling refusal at 2 feet	None		—
BH-3	1.0	Brown sandy silty clay	418.1 - TPH 413.2 - O&G	<100 mg/kg 100 mg/kg	9/8/87
BH-4 (composite)	2.5 4.5	Green-black clay; strong hydrocarbon odor Gray silty clay; strong gasoline smell	GC/FID - TPH	1,300 mg/kg Gasoline	9/2/87
BH-5 (composite)	2.5 6.0	Black sandy clay; strong hydrocarbon odor Green clay; strong odor	GC/FID - TPH	1,300 mg/kg Gasoline and <5% #2 Diesel	9/2/87
BH-6 (composite)	1.0 3.5	Black-brown gravelly clay; hydrocarbon smell Black clay; strong hydrocarbon smell	GC/FID - TPH	17 mg/kg Gasoline	9/2/87
BH-7 (composite)	3.5 9.5	Black organic clayey silt; strong hydrocarbon odor Orange-brown clay	GC/FID - TPH 8080 - PCBs	20 mg/kg #2 Diesel ND	9/8/87
BH-8 (composite)	2.5 6.0 9.0	Dark gray sandy clay; hydrocarbon odor Orange-light brown sandy clay; hydrocarbon/gasoline odor Dark brown clayey sandy silt; hydrocarbon odor	418.1 - TPH 413.2 - O&G 8080 - PCBs	<100 mg/kg <100 mg/kg ND	9/8/87

(a) Boreholes labeled BH were sampled by Engineering-Science, September 1987.
(b) Boreholes labeled EB were sampled by other consultants (Reference 6).

TFH = Total Fuel Hydrocarbons
TPH = Total Petroleum Hydrocarbons
O&G = Oil and Grease
VOCs = Volatile Organic Compounds
ND = Not Detected

Table 4-1 (continued)

Sample ID	Depth (ft)	Sample Description	Analyses Performed	Analytical Results	Date Sampled
BH-9	None	Drilling refusal at 3 feet	None		--
BH-9A (composite)	5.5	Green-gray sandy gravelly clay; faint hydrocarbon/gas and tallow factory odor	GC/FID - TPH 8080 - PCBs	16 mg/kg #2 Diesel ND	9/9/87
	10.0	Orange-brown clay; tallow factory odor			
BH-10	2.5	Black and green clay; tallow factory odor	418.1 - TPH 413.2 - O&G	<100 mg/kg <100 mg/kg	9/9/87
EB-1	3.0	Dark gray silty clay; fairly strong odor	GC/FID Gasoline Standard GC/FID Diesel Standard	1,600 mg/kg Gasoline 380 mg/kg Diesel Fuel	b
EB-2	2.5	Gray-green silty clay; slight odor	GD/FID Waste Oil Standard	ND	b
EB-3	3.0	Gray silty clay	GC/FID Waste Oil Standard	120	b
EB-4	4.5	Olive-gray silty clay; odor	Mod. 8015 - TFH 8240 - VOCs	ND 6 ppb Benzene 11 ppb Toluene	b
EB-5	6.0	Black silty clay; some odor	Mod. 8015 - TFH 503D - O&G (equivalent to 413.2 if no low boiling point compounds present)	ND 1,300 mg/kg	b
EB-6	7.5	Light gray silty clay; strong odor	GC/FID Waste Oil Standard GC/FID Gasoline Standard	190 mg/kg ND	b

Table 4-1 (continued)

Sample ID	Depth (ft)	Sample Description	Analyses Performed	Analytical Results	Date Sampled
WPRS-C	0.25 - 0.5	Composite soil sample collected at roughly a 100-foot grid across the site from approximately 3 to 6 inches below the surface.	8240 - VOCs 8080 - PCBs GC/FID - TPH Metals	ND 42 ppb PCB 1260 20 ppm Sb <4.3 Pb 100 Ba 240 Mb <0.35 Be 0.35 Ni 26 Cd 1.90 Ag <0.71 Cr 26 Th <5.3 Co 8.7 Vd 25 Cu 39 Zn 150	5/11/88
Peterson-ASP	2.0	Sample of tarry "asphalt" or bitumen	8240 - VOCs 8080 - PCBs GC/FID - TPH 200.7 - Pb 8270 - Base Neutrals	710 ppb Total Xylenes ND 43,000 ppm 440 ppm 6.1 ppm Fluorene 19 ppm Phenanthrene 7.7 ppm Fluoranthene 16 ppm Pyrene 23 ppm Chrysene 9.6 ppm Benzo(a)anthracene	5/6/88

including 19 ppm phenanthrene, 16 ppm pyrene, and 23 ppm chrysene. These components appeared to be tightly bound within the tarry matrix. The bitumen was also observed near the UST-1 excavation (Figure 3-1).

Composite Surface Soil Sampling

A composite sample of surface soils at the site confirm PCBs (0.042 ppm), petroleum hydrocarbons (20 ppm), and metals (barium at 240 ppm, Chromium at 26 ppm, lead at 100 ppm and zinc at 150 ppm, among others) are present at this site. Because the composite sample was made up of 24 individual grab samples, the results indicate the possibility of contamination hot-spots, or dispersed low levels of contamination in the surface soils at this site.

UNDERGROUND STORAGE TANK INVESTIGATION

All four tanks investigated were 10,000-gallon capacity, and constructed of steel. UST-1 was located on the northwestern area of the site (Figure 3-1). The tank was used to store hexane from 1965 to 1978. In mid-1986, diesel fuel was transferred to this tank from UST-4. When excavated it contained a small amount of amber liquid and gray brown sludge with diesel odor. A sample of the contents was found to contain 46 mg/l of gasoline and 85 mg/l of Arochlor 1221 (PCB) in oil. The tank had passed a leak test in 1986 (Reference 5) but was found to be rusted when removed.

UST-2 was the northernmost tank of the pair located east of the fuel island. Laboratory analysis of the aqueous samples collected from inside the tank identified 750 mg/l (ppm) diesel fuel.

UST-3, the southernmost of the pair of tanks in the fuel island area, was used to store gasoline until 1981. When the plant was closed, however, the tank was being used to store a small amount of diesel fuel (Reference 7). At the time of this investigation the contents were analyzed and found to be diesel.

UST-4 was located southeast of the boiler room, and approximately 50 feet southwest of the fuel pump island. The tank originally contained

No. 6 boiler fuel. A dark brown oily sample of the contents was analyzed and found to be 21 percent diesel/boiler fuel.

Descriptions of underground storage tank samples and analytical results are summarized in Table 4-2. Laboratory analytical reports and chain-of custody records are included in Appendix A.

MONITORING WELL INSTALLATION AND SAMPLING

A soil sample collected at 4.5 feet in the borehole for monitoring well MW-3 was found to contain 1,100 ppm total petroleum hydrocarbons. This value confirms the location of an area of hydrocarbon soil contamination identified just west of UST-1 in the original site assessment report of February 1987 (Reference 6).

A soil sample collected from 5 feet in the borehole for monitoring well MW-1 was found to contain 360 ppm gasoline and diesel. This value is below the current State and county action levels for TPH in soil, but is nevertheless a significant quantity. As far as is known, there is not an underground storage tank in this area.

Groundwater samples confirm the presence of 21 ppm total fuel hydrocarbons (TFH) in groundwater from MW-1 near UST-1, and 2.7 ppm TFH in groundwater from MW-3 near UST-4. Groundwater samples from MW-2 at the western end of the site were found to contain 200 ppm total oil and grease but less than 5 ppm total petroleum hydrocarbons, indicating that the oil and grease is probably from animal sources. There are no apparent action levels for animal fat, oil, or grease in groundwater.

A summary of monitoring well soil and groundwater sample analytical results are presented in Table 4-3. Laboratory reports and chain-of-custody records are included in Appendix A.

Table 4-2
Analytical Results of Underground Storage Tank Contents
Wareham Development, Peterson Manufacturing Parcel

Tank ID	Status	Tank Size (gallons)	Depth of Tank Bottom (in feet)	Thickness of Tank Contents (in feet)	Description of Tank Contents	Analysis Performed	Analytical Results	Tank History	Date Sampled
UST1	Excavated	10,000	10.92	0.75	Amber water-like liquid with gray-brown sludge (separated) with diesel odor	GC/FID - TPH PCBs	46 mg/l C5-C12 Hydrocarbons 85 mg/kg Arochlor 1221 in oil	Stored hexane from 1965 to 1978. Reportedly stored water and #6 boiler Fuel prior to excavation.	9/18/87
UST2	Excavated	10,000	10.58	0.42	Oily amber liquid with slight gas or solvent odor with surface beads of oil or water	GC/FID - TPH Tetraethyl lead	750 mg/l C9-C22 Hydrocarbons 0.3 mg/l	Tank in place at least since 1957. Stored #2 diesel fuel and possibly gasoline.	9/18/87
UST3	Excavated	10,000	10.75	0.38	Amber liquid with faint turpentine odor	GC/FID - TPH Tetraethyl lead	100% C9-C22 (mostly C10-C16) <0.2 mg/l Tetraethyl lead	Tank is 20 to 30 years old. Stored gasoline until 1981, then stored diesel fuel.	9/18/87
UST4	Excavated	10,000	10.79	0.38	Dark brown oil may contain animal fat	GC/FID - TPH PCBs	21% C9-C22 (mostly higher end) <1 mg/kg Arochlor in oil	Tank is about 20 years old. Initially contained #2 boiler fuel. Reportedly stored #6 boiler fuel prior to excavation.	9/18/87
UST5	Excavated	Unknown						Excavated in 1963. Tank formerly contained #2 boiler fuel and possibly gasoline.	
UST6	Excavated	8,000						Tank, present in 1957, was removed in the mid-1970's. Probably contained gasoline.	

Table 4-3
Analytical Results of Monitoring Well
Soil and Groundwater Samples
Wareham Development, Peterson Manufacturing Parcel

Sample ID	Sample Description	Analyses Performed	Analytical Results	Date Sampled
MW-1,5	Soil sample collected at a depth of 5.0 feet, monitoring well number 1	Lead	4.9 mg/kg	11/5/87
		Ethylene Dibromide	ND	
		Benzene	0.7 mg/kg	
		Toluene	0.8 mg/kg	
		Total Xylene Isomers	1.2 mg/kg	
		GC/FID - TPH	360 mg/kg Gasoline and Diesel	
MW-2,5	Soil sample collected at a depth of 5.0 feet, monitoring well number 2	418.1 - TPH	< 250 mg/kg	11/6/87
		413.2 - O&G	< 250 mg/kg	
		GC/FID - TPH	< 10 mg/kg	
MW-3,4.5	Soil sample collected at a depth of 4.5 feet, monitoring well number 3	8080 - PCBs	< 0.3 mg/kg	1/6/88
		GC/FID - TPH	1,100 mg/kg	
		8240 - VOCs	Toluene 0.6 mg/kg	
MW-1	Groundwater sample from monitoring well number 1	7420 - Pb	0.031 mg/1	11/12/87
		Ethylene Dibromide (EDB)	<0.02 ug/1	
		602 - BTX	1.7 mg/1 Benzene	
			2.6 mg/1 Toluene	
			4.2 mg/1 Total Xylene Isomers	
		Mod. 8015 - TPH	21 mg/1	
MW-2	Groundwater sample from monitoring well number 2	413.2 - O&G	200 mg/1	11/12/87
		418.1 - TPH	<5 mg/1	
		Mod. 8015 - TPH	<1.0 mg/1	
MW-3	Groundwater sample from monitoring well number 3	8080 - PCBs	<0.3 ug/1	1/13/88
		Mod. 8015 - TPH	2.7 mg/kg	
		8240 - VOCs	2ppb	

ABOVE GROUND STORAGE TANK INVESTIGATION

Elevated levels of total petroleum hydrocarbons were identified in samples from above ground storage tanks TF-1, TF-2, TF-3, TF-5, and TF-7. These values ranged from 5,200 ppm in the sample from TF-5, to 150,000 ppm in the sample from TF-2.

Elevated levels of total oil and grease (TOG) were also identified in two of the three samples submitted for this analysis. Sample TF-1 contained 330,000 ppm and sample TF-7 contained 43,000 ppm. Both samples are probably primarily animal fat, oil, and grease. The one liquid sample from TF-4 contained 38 ppm TOG.

All tank samples were submitted for volatile organic compounds analysis. The results indicate the presence of 3.6 ppm chloroform and 5.99 ppm C6-C7 hydrocarbons (possibly hexane) in TF-1, 2.8 ppm chloroform and 14 ppm acetone in TF-2, and 2.6 ppm toluene in TF-7.

The RWQCB requires wastes with concentrations of total petroleum hydrocarbons over 1,000 ppm be disposed of in a Class I landfill. Therefore, the contents of tanks TF-1, TF-2, TF-3, TF-5 and TF-7 were recommended for disposal as hazardous in a Class I facility.

A sample of standing water from the tank farm area was found to contain 14 ppm TOG, 4.8 ppm TPH, and 0.083 ppm (83 parts per billion [ppb]) C6 hydrocarbons (possibly hexane).

A summary of the above ground storage tank sample analytical results are presented in Table 4-4. Laboratory analytical reports and chain-of-custody records are included in Appendix A.

SUMP CONTENT SAMPLING

Samples of water from the tank farm sump (TF-S), collected on 1 March 1988, were found to contain 4,200 ppm total oil and grease (TOG), 86 ppm total petroleum hydrocarbons (TPH) and 1.4 ppm toluene. The TOG probably represents primarily animal fat, oil, and grease. A second sample was collected on 24 March 1988 to confirm the level of toluene identified.

Table 4-4
Analytical Results of Above Ground Storage Tank Samples
Wareham Development, Peterson Manufacturing Parcel

Sample	Sample Descriptions	Analyses Performed	Analytical Results	Date Sampled
TF-1	White to gray solid (congealed fat)	413.2 - O&G 418.1 - TPH 8240 - VOCs Moisture	330,000 ppm 12,000 ppm 3,600 ppb Chloroform 5,990 ppb C6-C7 Hydrocarbons 14.6 percent	3/1/88
TF-2	Yellowish to black semi-solid and solid	418.1 - TPH 8240 - VOCs	150,000 ppm 2,800 ppb Chloroform 14,000 ppb Acetone	4/1/88
TF-3	Dark red-brown semi-solid and solid	418.1 - TPH 8240 - VOCs	7,900 ppm ND	4/1/88
TF-4	Dark liquid	413.2 - O&G 418.1 - TPH 624 - VOCs	38 ppm 12 ppm ND	3/24/88
TF-5	Light-yellow semi-solid	418.1 - TPH 8240 - VOCs	5,200 ppm ND	4/1/88
TF-6	Iron oxide flakes	Not Analyzed		3/1/88
TF-7	Gray-black sludge with brown crusty surface	413.2 - O&G 418.1 - TPH 8240 - VOCs Moisture	43,000 ppm 1,900 ppm 2,600 ppb Toluene 78 percent	3/1/88
TF-W	Standing water northwest of Aboveground Tank 1, with red-brown oily phase (only water component analyzed)	413.2 - O&G 418.1 - TPH 8240 - VOCs	14 mg/l 4.8 mg/l 83 ug/l C6 Hydrocarbon	3/1/88

Toluene (1.1 ppm) was confirmed present in the second sample. Because of the level of TPH, TOG and toluene present, the approximately 50 gallons of water in the sump were recommended for disposal as hazardous waste.

Water samples from the large concrete sump (LC-S) were analyzed for TOG and found to contain 9 ppm. Other analyses included chemical oxygen demand (COD), pH, and total suspended solids (TSS). No analyses for TPH or VOCs were performed because there was no obvious contamination nor reason to believe that such contaminants would be present. At one point an oily sheen appeared on the water but was found to have been applied by the mosquito abatement crew of the county health department. The oily surface was removed by a hazardous waste hauler, and the liquid remaining in the sump (15,000 gallons) was sprayed over the site for dust control.

The large metal trough (LM-S) located east of the main plant contained abundant floating animal fat, oil, and grease. Samples were collected from the surface, from 3.5 feet below the surface and from the bottom of the trough. Total oil and grease (TOG) was only found to be present in the surface sample (570 ppm). The top approximately one half of the water in the trough was removed by a hazardous waste hauler, and the remaining approximately 10,000 gallons was sprayed over the site for dust control.

Samples collected from the small concrete sump (SC-S) inside the main plant were found to contain 5,700 total petroleum hydrocarbons, 6,900 total oil and grease, and 0.023 ppm (23 ppb) toluene. The TPH is believed to be from mosquito control spraying, and the TOG primarily from animal fat, oil, and grease. The water in this sump was disposed of as hazardous by a waste hauler.

Samples were collected from both sides of the solvent plant sump (SP-Sa and b), and analyzed for TPH, TOG, and VOCs. The results indicate that the larger south compartment (SP-Sa) contained 34 ppm TPH, 47 ppm TOG, 0.021 ppm toluene, and 0.22 ppm C5 to C6 hydrocarbons (probably hexane). Samples collected from the smaller compartment were found to contain 10 ppm TPH, 60 ppm TOG, and 0.041 ppm C5 to C6 hydrocarbons (probably hexane). Contents of both compartments were recommended for disposal as hazardous.

Analytical results from the sump sampling are presented in Table 4-5. Laboratory analytical reports and chain-of-custody records are included in Appendix A.

WATER WELL INVESTIGATION

A sample of the 24 feet of floating product in the well was found to contain 250 ppm diesel, 780 ppm unleaded gasoline and 59 ppm arochlor PCB. The product layer was pumped from the well and hauled off-site by a hazardous waste hauler under the direction of Plant Reclamation on 8 April 1988.

After clearing and purging the well, water samples collected from 90 feet below ground surface (BGS) were found to contain a variety of total petroleum hydrocarbon (TPH), PCBs, volatile organic compound (VOC), and polynuclear aromatic hydrocarbon (PNA) contaminants. These included 40 ppm TPH, 0.024 ppm (2.4 ppb) Arochlor 1254 (PCB), 5 ppm C6 to C11 unidentified VOCs, and 50 ppm C9 to C30 unidentified PNAs.

Water samples collected from the 150-foot (BGS) level were found to contain 3.3 ppm TPH, 0.90 ppm (900 ppb) C6-C11 hydrocarbon VOCs, 0.50 ppm methylethyl ketone VOC, and various PNAs including 20 ppm C9 to C30 unidentified PNAs, 0.019 ppm (19 ppb) phenenthrene, 0.026 ppm (26 ppb) pyrene, and 0.032 ppm (32 ppb) fluoranthene. A sample of water from this depth was also tested for general minerals analysis (GMA) according to drinking water standards and found to be high (600 ppm) in total dissolved solids (TDS) and total hardness (320 ppm). This would not meet drinking water standards on the basis of the GMA. No PCBs were detected in samples from this level.

Water samples collected from the 300-foot level were found to contain 0.040 ppm (40 ppb) each of unidentified C6 to C11 hydrocarbons, and methylethyl ketone, 0.010 ppm (10 ppb) acetone VOCs, and various PNAs including 0.016 ppm (16 ppb) pyrene, and 0.018 ppm (18 ppb) fluorene. A sample was also collected from this depth, tested for GMA according to drinking water standards, and found to be high in total dissolved solids (640 ppm) and total hardness (350 ppm). This water would not meet

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WATER WELL INVESTIGATION

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Table 4-5
Analytical Results of Sump Samples
Wareham Development, Peterson Manufacturing Parcel

Sample	Sample Descriptions	Analyses Performed	Analytical Results	Date Sampled
TF-S	Sump 10 feet east of Aboveground Tank 1, gray liquid with particulates and lumpy floating component	413.2 - O&G 418.1 - TPH 8240 - VOCs	4,200 ppm O&G 86 ppm 1,400 ppb Toluene	3/1/88
LC-S (IV Vat)	Concrete sump inside main building, light colored liquid with oily film on surface	413.2 - O&G	9 ppm	3/16/88
LM-Sa (OV Trough)	Surface sample from trough west of main building, grayish-colored liquid with no film on surface and strong fat odor	413.2 - O&G	570 ppm	3/16/88
LM-Sb	Sample collected at a depth of 3.5 feet in trough	413.2 - O&G	<5 ppm	3/22/88
LM-Sc	Sample collected at bottom of trough, minor black sediments	413.2 - O&G	<5 ppm	3/22/88
TF-Sa	Sample collected to verify high Toluene value in sample TF-S	8240 - VOCs	1,100 ppb Toluene	3/24/88
SC-S	Small concrete sump inside main plant, dark liquid with scummy surface	418.1 - TPH 413.2 - O&G 624 - VOCs	5,700 ppm 6,900 ppm 23 ppb Toluene	4/7/88
SP-Sa	South (larger) compartment of solvent plant sump, dark liquid with floating matter	418.1 - TPH 413.2 - O&G 624 - VOCs	34 ppm 47 ppm 21 ppb Toluene 220 *ppb C5-C6 Hydrocarbons*	4/7/88
SP-Sb	North (smaller) compartment of solvent plant sump, dark green liquid with floating matter	418.1 - TPH 413.2 - O&G 624 - VOCs	10 ppm 60 ppm 41 ppb C5-C6 Hydrocarbons	4/7/88

drinking water standards on the basis of the GMA. No PCBs or TPH were detected in samples from this well.

The contents of Baker tank A were found to contain 0.10 ppm (100 ppb) nickel and 0.05 ppm (50 ppb) Selenium. Total fuel hydrocarbons, aromatic volatile organics, PCBs and all other priority pollutant metals were below detection limit values. The contents of Baker tank B were found to contain 1.1 ppm (1,100 ppb) C7 to C9 and C11 to C22 hydrocarbons, 0.060 ppm (60 ppb) Nickel, and 0.200 ppm (200 ppb) Selenium. All aromatic volatile organics, PCBs and other priority pollutant metals were below detection limits. These results confirmed contaminant concentrations at sufficiently low levels to allow for the disposal of both tanks' contents into the storm sewer (Reference 11).

Water well and Baker storage tank sampling analytical results are summarized in Table 4-6. Laboratory analytical reports and chain-of-custody records are included in Appendix A.

Table 4-6
Analytical Results of Water Well Samples
Wareham Development, Peterson Manufacturing Parcel

Sample ID	Sample Description	Analyses Performed	Analytical Results	Date Sampled
WW-1-A	Grab sample from liquid surface in water well	Mod. 8015 - TPH	17,000 ppm	2/26/88
WW-1-1P	Product sample from water well	GC/FID - TPH	250 ppm Diesel #2 780 ppm Unleaded Gasoline	4/7/88
WW-1-2P	Product sample from water well	8080 - PCBs	59 ppm Arochlor	4/7/88
WW-1-1W	Grab sample of water from well after product removed	GC/FID - TPH 608 - PCBs 624 - VOCs	550 ppm 10 ppb Arochlor 1254 7 ppb Benzene 170 ppb Cyclohexane 340 ppb Methylcyclopentane 30 ppb 2,3-Dimethylbutane 130 ppb 3-Methylpentane 220 ppb 2-Methylpentane 340 ppb Hexane	4/13/88
WW-1-90	Environmental sample from 90 feet below top of casing of well, after purging	GC/FID - TPH 608 - PCBs 624 - VOCs 625 - Base Neutral Priority Pollutants	40 ppm Total Fuel Hydrocarbons 2.4 ppb ug/l Arochlor 1254 13 ppb Toluene 600 ppb 4-Methyl-2-pentanone 5 ppm C6-C11 Hydrocarbons 24 ppb Acenapthene 32 ppb Anthracene 54 ppb Benzo(a)anthracene 18 ppb Benzo(a)pyrene 28 ppb Benzo(a)fluoranthene 8 ppb Benzo(g,h,i)perylene 30 ppb Benzo(k)fluoranthene 40 ppb Chrysene 4 ppb Dibenzo(a,h)anthracene 30 ppb Fluorene 70 ppb Fluoranthene 8 ppb Indeno(1,2,3-c,d)pyrene 110 ppb Phenanthrene 130 ppb Pyrene 50 ppm C9-C30 Hydrocarbons	5/11/88

Table 4-6 (continued)

Sample	Sample Descriptions	Analyses Performed	Analytical Results	Date Sampled
WW-1-150	Environmental sample from 150 feet below top of casing of well after purging	GC/FID - TPH	3,300 ppb Total Fuel Hydrocarbons	5/11/88
		608 - PCBs	ND	
		624 - VOCs	200 ppb Acetone	
			900 ppb C6-C11 Hydrocarbons	
			500 ppb Methyl-Ethyl-Ketone	
		625 - Base Neutral Priority Pollutants	4 ppb Acenapthene	
			5 ppb Anthracene	
			5 ppb Benzo(a)anthracene	
			4 ppb Benzo(b)fluoranthene	
			4 ppb Benzo(k)fluoranthene	
			6 ppb Chrysene	
			4 ppb Fluorene	
			32 ppb Fluoranthene	
			19 ppb Phenanthrene	
			26 ppb Pyrene	
			20 ppm C9-C30 Hydrocarbons	
		General Mineral Analysis	7.5 meq/l Anions	5/11/88
			9.8 meq/l Cations	
			600 ppm TDS	
			320 ppm Total Hardness	
			21 ppm Iron	
			2.2 ppm Manganese	
WW-1-300	Environmental sample from 300 feet below top of casing of well, after purging	GC/FID - TPH	ND	5/11/88
		608 - PCBs	ND	
		624 - VOCs	100 ppb Acetone	
			400 ppb C6-C11 Hydrocarbons	
			400 ppb Methyl-ethyl-ketone	
		625 - Base Neutral Priority Pollutants	4 ppb Benzo(a)anthracene	
			2 ppb Benzo(a)pyrene	
			2 ppb Benzo(k)fluoranthene	
			4 ppb Chrysene	
			18 ppb Fluorene	
			16 ppb Pyrene	
			7 ppm C9-C30 Hydrocarbons	
		General Mineral Analysis	10.6 meq/l Anions	
			10.6 meq/l Cations	
			640 ppm TDS	
			350 ppm Total Hardness	
			12 ppm Iron	
			2.9 ppm Manganese	

Table 4-6 (continued)

Sample ID	Sample Description	Analyses Performed	Analytical Results	Date Sampled
BT-A	Baker tank A composite from top, middle and bottom	3510/8015 - TPH	ND	5/20/88
		602 - BTX	ND	
		608 - PCBs	ND	
		Metals - 13 Priority Pollutants	100 ppb Ni 50 ppb Zn	
BT-B	Baker tank B composite from top, middle and bottom	3510/8015 - TPH	1,100 ppb C7-C9 & C11-C22 Hydrocarbons	5/20/88
		602 - BTX	ND	
		608 - PCBs	ND	
		Metals - 13 Priority Pollutants	60 ppb Ni 200 ppb Se	

SECTION 5
SITE REMEDIATION

Site remediation at the Peterson Manufacturing parcel has included the excavation and on-site landfarming and aeration of over 2,000 cubic yards of gasoline- and diesel-contaminated soil, the removal of four underground storage tanks, the closure of three 20-foot monitoring wells, and the closure of a 350-foot contaminated water well. The closure of sumps and above ground storage tanks, and the disposal of their contents was conducted by Plant Reclamation and was not included in the scope of work for ES. Following these activities, the site was paved and a slab concrete tilt-up building constructed.

CONTAMINATED SOIL EXCAVATION AND TREATMENT

During the spring of 1988, RWQCB guidelines for addressing fuel leaks from underground storage tanks suggest that concentrations of gasoline or diesel greater than 1,000 ppm (1,000,000 ppb) be excavated and disposed of, or treated (Reference 12). Under certain circumstances, the RWQCB has allowed on-site disposal of contaminated soil directly beneath an asphalt surface, providing concentrations are below 1,000 ppm. According to the guidelines, if concentrations of gasoline or diesel above 100 ppm are detected, a groundwater investigation involving monitoring wells is required (Reference 12).

In May 1988, the RWQCB published more restrictive guidelines for evaluating underground fuel leaks which are being considered for adoption. The new guidelines take into consideration site specific environmental conditions and could require that concentrations of total

petroleum hydrocarbons above 100 ppm would require excavation and disposal or treatment (Reference 13).

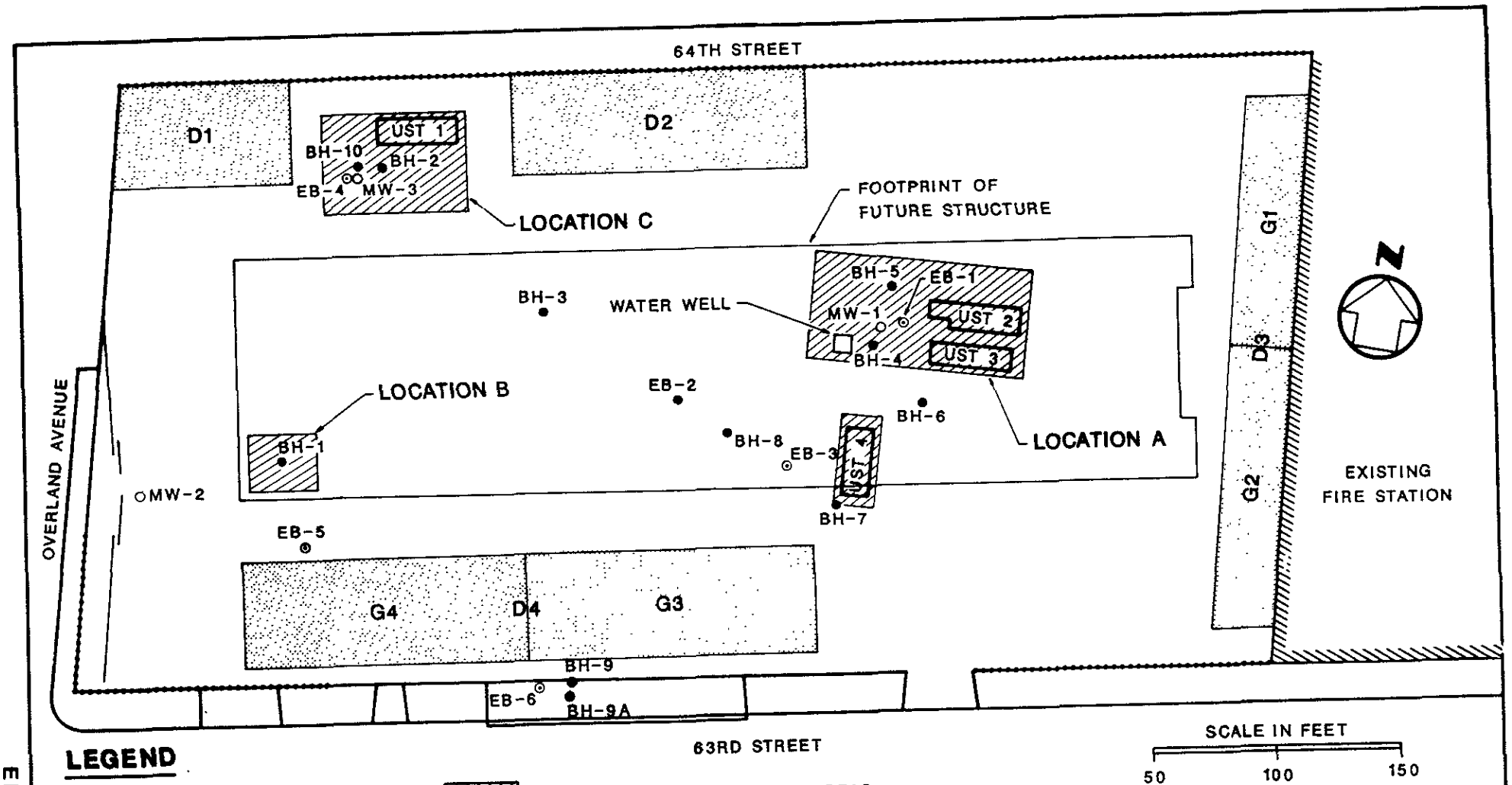
Soil Excavation of Contamination Hotspots

During site characterization activities, total petroleum hydrocarbon contamination was confirmed at concentrations greater than 1,000 ppm in soil samples from boreholes BH-4, BH-5, and EB-1 (Location A, west of the fuel island), from borehole BH-1 (Location B, west of the main plant), and from sample MW-3,4.5 collected during the installation of monitoring well MW-3 near UST-1 (Location C). The locations of these contamination hot-spots are shown in Figure 5-1.

Excavation Near Fuel Island (Location A). Soil samples collected in boreholes during the preliminary site investigation (Reference 6) and the ES initial site investigation phase (Reference 2) confirmed the presence of TPH in concentrations exceeding 1,000 ppm in the area west of USTs 2 and 3 near the center of the project site (Figure 5-1). Soil containing gasoline (350 ppm) and diesel (170 ppm) was also identified at the western ends of the nearby excavations for UST-2 and UST-3 (respectively), though at significantly lower concentrations. Therefore, according to the guidelines, hydrocarbon concentrations identified in the tank excavation did not require excavation and disposal or treatment, but soil samples collected in the nearby boreholes west of the excavations did.

The excavation of contaminated soil began in the vicinity of borehole BH-5 on 17 May, and continued through 19 May 1988 (Thursday) using a tractor mounted backhoe (CASE model 580E extendahoe). On 23 May (Monday), work resumed with a large capacity excavator in order to accelerate the work. The excavation was completed and the final confirmation samples were collected on 23 May.

Each day, the progress of the excavation was monitored by collecting occasional samples from the backhoe bucket in small plastic bags and analyzing them with a photoionization detector (Photovac Tip) calibrated to isobutylene with a span setting of 6. Empirically, this provided optimum sensitivity to fuel hydrocarbons in the soil at this



LEGEND

- BH-1 ES BOREHOLE
- EB-1 KALDVEER BORING, APPROXIMATE LOCATION
- MW-1 MONITORING WELL
- UST 1 UNDERGROUND STORAGE TANK LOCATIONS
- SOIL AND TANK EXCAVATION AREAS
- LANDFARM REMEDIATION AREAS

SITE MAP
PETERSON MANUFACTURING CO. PARCEL
EMERYVILLE, CALIFORNIA

WITH BOREHOLES, MONITORING WELLS, UNDERGROUND TANKS, SOIL EXCAVATION LOCATIONS AND LANDFARM REMEDIATION AREAS

Base: "Plot Plan" by John F. Tulloch. Engineers, Contactors, dated January 24, 1968

ENGINEERING-SCIENCE

FIGURE 5-1

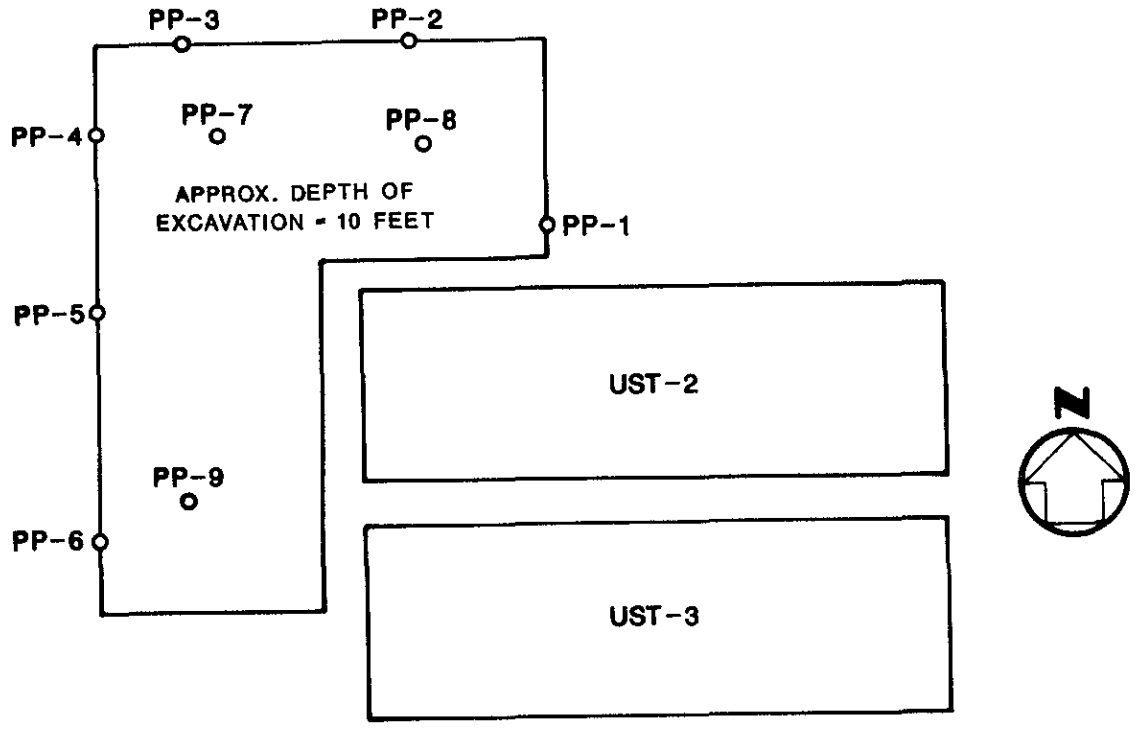
site. In this way, the excavation was able to progress in the direction of the highest Photovac readings (over 100). At the end of each day, samples were collected from around the perimeter of the excavation and submitted for 48-hour rush turnaround analysis by modified EPA method 8015 for total petroleum hydrocarbons. Wherever TPH concentrations were confirmed to be above 1,000 ppm, the excavation proceeded in that direction on the following day.

Excavation spoils were stockpiled near the excavator as was most convenient. As the excavation grew, the stockpiles were relocated. At the end of the excavation, the stockpiles were moved to pre-prepared remediation areas. The breathing space surrounding the excavation was continually monitored according to Health and Safety Plan specification (Reference 14).

The depth of borehole samples in which concentrations over 1,000 ppm had been identified in Location A ranged from 2.5 to 6 feet below the ground surface (BGS). The excavation began on 17 May at the BH-5 location where a hole was dug to groundwater, encountered at a depth of 10 feet. Grab samples of the soil from various depths in the excavation were collected and analyzed with the Photovac. The highest concentrations of TPH were identified in a grey-green sandy silty clay ranging from a depth of 3 to 10 feet BGS. Samples collected from this formation consistently smelled strongly of gasoline and registered elevated readings (100+) on the Photovac.

The same layer of soil with similar characteristics was encountered throughout the excavation in this area, however, its depth and thickness decreased as the work progressed away from the UST-2 and 3 tank excavations. A soil barrier approximately 2 feet thick was maintained between the current excavation and the UST-2 and 3 excavations to keep the groundwater accumulated in the UST pits from flowing into the current excavation area.

At the end of the day, nine (9) soil samples were collected from the bottom and perimeter of the excavation and submitted for 48-hour rush analysis for TPH concentrations. The extent of the excavation, sampling locations, and analytical results are shown in Figure 5-2. Laboratory



SAMPLE ID	ANALYSED FOR	GC PETROLEUM HYDROCARBONS (PPM)	DIESEL (PPM)
PP-1	(GC-FID)	1600	300
PP-2	(GC-FID)	ND	ND
PP-3	(GC-FID)	200	200
PP-4	(GC-FID)	91	91
PP-5	(GC-FID)	48	48
PP-6	(GC-FID)	2000	2000
PP-7	(GC-FID)	ND	ND
PP-8	(GC-FID)	200	200
PP-9	(GC-FID)	78	78

WAREHAM PETERSON SITE, EMERYVILLE, CALIFORNIA
CONTAMINATED SOIL EXCAVATION DETAILS
MAY 17, 1988

analytical reports and chain-of-custody records are included in Appendix A.

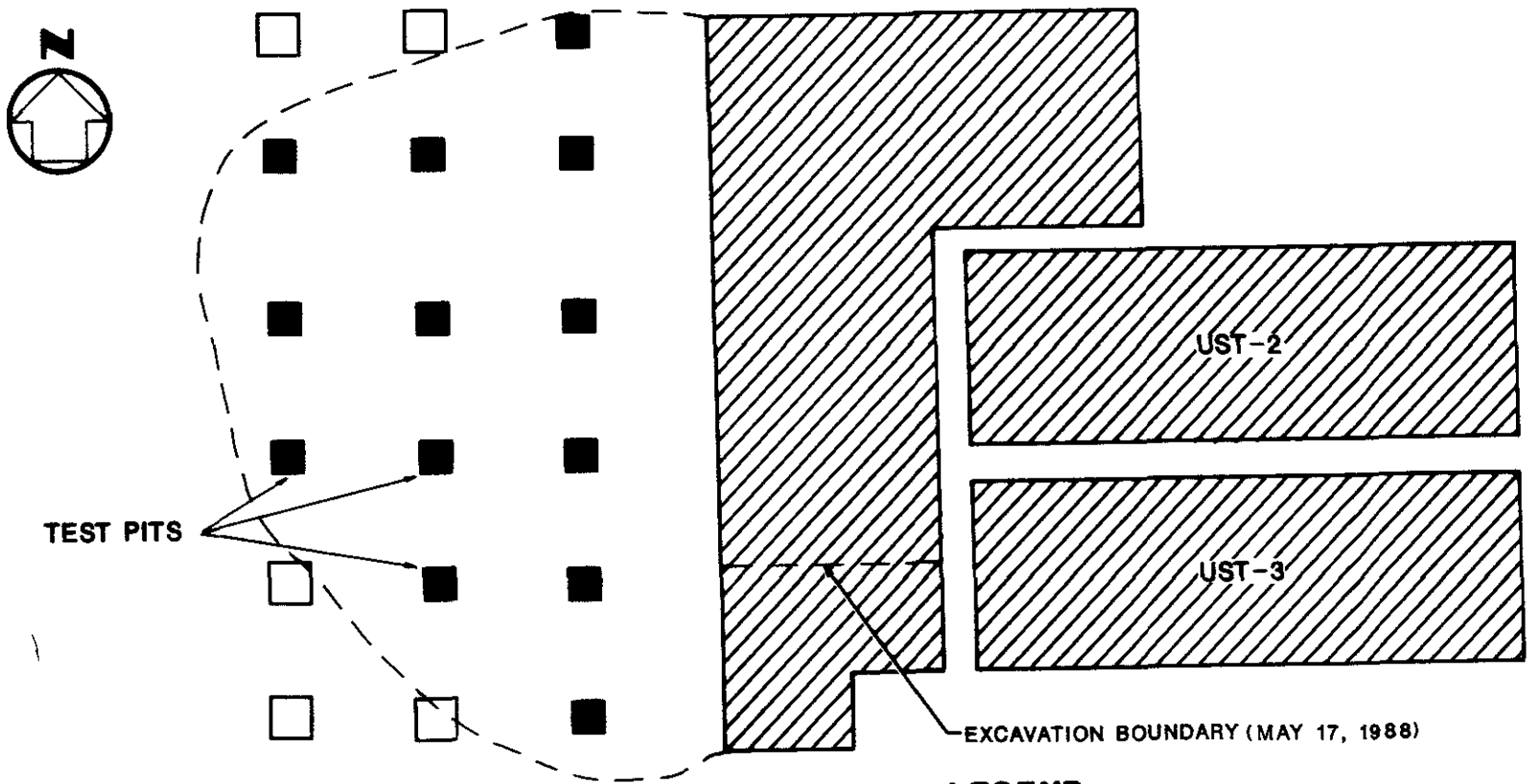
Confirmation analyses from the previous day's excavation were not available on the morning of 18 May, however, elevated concentrations of hydrocarbons were identified by the Photovac near the southwest corner of the excavation (Figure 5-2, location PP-6). The excavation was continued at this location and proceeded to the south. With no end to the contamination in site, exploration trenches (5 feet long by 5 feet wide by 6 to 8 feet deep) were dug to the west of the main excavation to determine the potential size to which the excavation might grow. Photovac readings were taken of samples from each of the trenches, which were subsequently marked as contaminated or clean. The extent of the excavation on 18 May, and the locations of the trenches, are shown in Figure 5-3.

The excavation was halted at 2:00 PM on May 19 during the excavation of the exploratory trenches when Photovac readings indicated high (100+) organic vapor concentrations in the breathing zone. All personnel were asked to leave the site. Work was resumed after direct measurements indicated vapor concentrations in the breathing zone were not a health hazard.

The excavation proceeded into the area determined by the exploratory trenches to be contaminated. This included the location of the closed 350-foot water well. The well bore itself was found to be completely filled with concrete. However, the concrete plug apparently did not penetrate the gravel pack in this near surface portion of the well, as it was found uncemented and saturated with black oil.

At the end of the day, three soil samples (PP-10, PP-11, and PP-12) were collected from around the western perimeter of the excavation (Figure 5-4). The results obtained prior to resuming work on the 23rd indicated TPH concentrations below 1,000 ppm along the western perimeter of the excavation.

The TPH concentration in sample PP-1 in the far northeast corner of the excavation was found to exceed 1,000 ppm, therefore, the excavation was



WAREHAM PETERSON SITE,
EMERYVILLE, CALIFORNIA
CONTAMINATED SOIL EXCAVATION DETAILS
MAY 18, 1988

LEGEND

■ PITS SHOWING HIGH READINGS ON PHOTOVAC

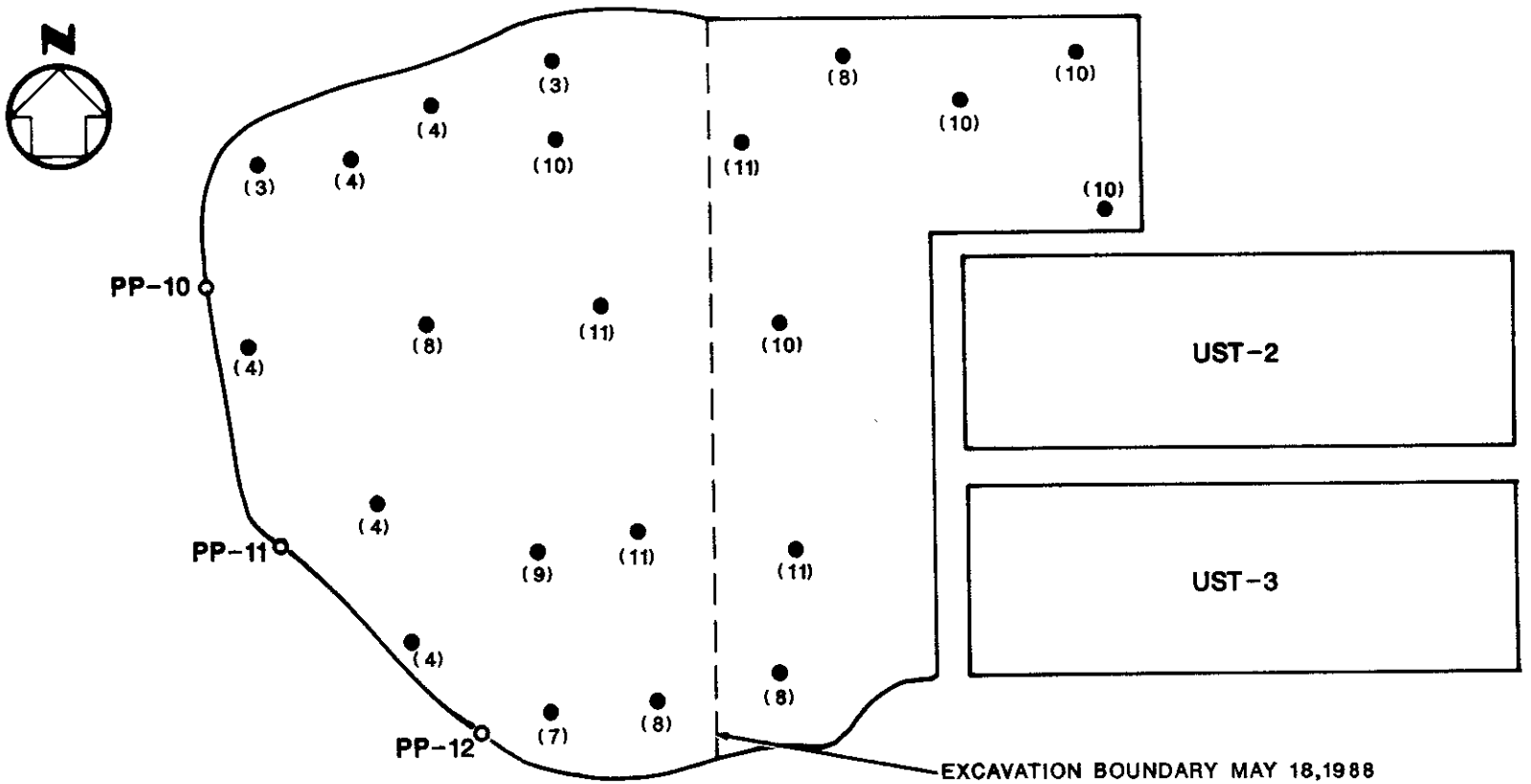
□ PITS SHOWING RELATIVE LOW (<100) READINGS ON PHOTOVAC

NOTE: DEPTH OF PITS 5 TO 6 FEET
DEPTH OF CONTAMINATED LAYER OF SOIL DECREASED IN THE WEST DIRECTION

0 5 10
SCALE IN FEET

FIGURE 5-3

ENGINEERING-SCIENCE



LEGEND

(4) – DEPTH IN FEET FROM THE SURFACE

SAMPLE ID	ANALYZED FOR	GASOLINE (PPM)	DIESEL (PPM)
PP-10	(GC-FID)	ND	ND
PP-11	(GC-FID)	ND	83
PP-12	(GC-FID)	ND	92

0 5 10
SCALE IN FEET

WAREHAM PETERSON SITE, EMERYVILLE, CALIFORNIA CONTAMINATED SOIL EXCAVATION DETAILS MAY 19, 1988

ENGINEERING-SCIENCE

FIGURE 5-4

resumed in that area with a large capacity excavator. The soil barriers dividing the main excavation and the two UST excavation pits were also excavated and stockpiled. Loose soil from the excavation area was removed, and three confirmation soil samples were collected from the remaining base and side walls. The resulting excavation and locations of the final confirmation samples are shown in Figure 5-5. A summary of the confirmation sample descriptions and analytical results are shown in Table 5-1. Laboratory analytical reports and chain-of-custody records are included in Appendix A.

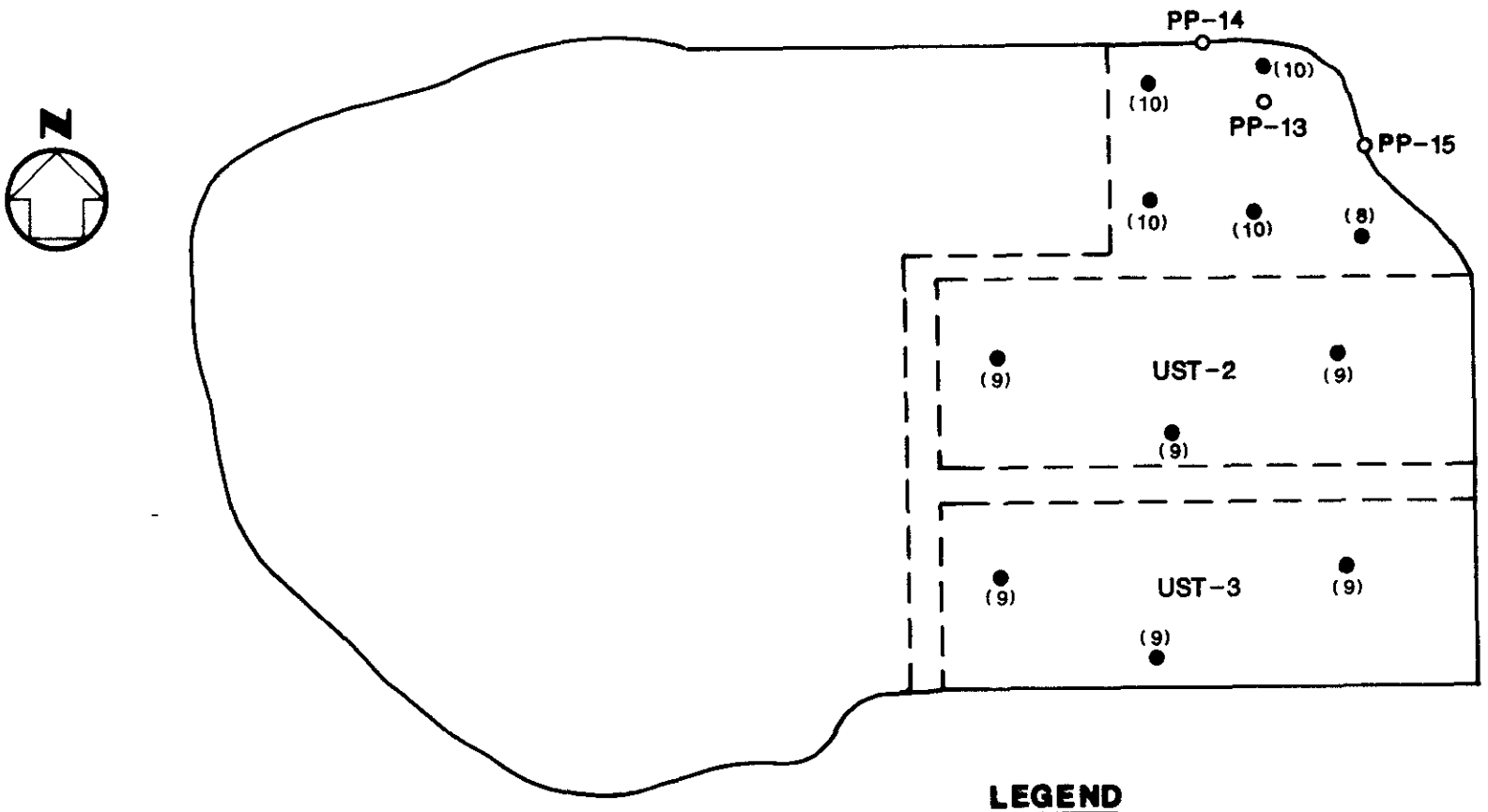
The final confirmation samples contained concentrations of TPH below 1,000 ppm; therefore, no further excavations were performed.

Excavation West of Main Plant (Location B). Levels of total petroleum hydrocarbons and oil and grease were identified in BH-1 (west of the main plant) at levels exceeding 1,000 ppm. The area was investigated with a backhoe on 9 May 1988. Dark stained soil with petroleum hydrocarbon odor was encountered in gray-green silty clays from 2 to 5 feet below the ground surface.

Approximately 70 cubic yards of contaminated soil was excavated from an area measuring approximately 10 feet by 20 feet by 10 feet deep. A composite soil sample (EXNBH-1) was collected from the base and sides of the excavation and was submitted for 24-hour rush turnaround analysis by GC/FID for total petroleum hydrocarbons. None were detected. The sample description and analytical results are shown in Table 5-1. The laboratory analytical report and chain-of-custody records are included in Appendix A.

Excavation Near UST-1 (Location C). Concentrations of total petroleum hydrocarbons exceeding 1,000 ppm were encountered in soil sample MW-3,4.5 near the southwest corner of UST-1. This area was investigated with a backhoe on 9 April 1988.

Three exploratory trenches were dug in the area to the south and west of the UST-1 location. The first trench was excavated approximately 10 feet south of the southeastern end of UST-1. The trench measured approximately 5 feet wide by 20 feet long by 6 feet deep. Groundwater



LEGEND

(10) – DEPTH OF EXCAVATION IN FEET

WAREHAM PETERSON SITE, EMERYVILLE, CALIFORNIA CONTAMINATED SOIL EXCAVATION DETAILS MAY 23, 1988

	SAMPLE ID	ANALYZED FOR	GASOLINE (PPM)	DIESEL (PPM)
Composite	PP-14	(GC-FID)	790	ND
Composite	PP-15	(GC-FID)	490	ND
	PP-15 (Rerun)			

0 5 10
SCALE IN FEET

ENGINEERING-SCIENCE

FIGURE 5-5

Table 5-1
Analytical Results of Confirmation Samples
from Hot Spot Remediation Areas
Wareham Development, Peterson Manufacturing Parcel

Sample ID	Sample Description	Analyses Performed	Analytical Results	Date Sampled
PP-1	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	300 ppm Diesel 1600 ppm TPH	5/17/88
PP-2	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	ND Diesel ND TPH	5/17/88
PP-3	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	200 ppm Diesel 200 ppm TPH	5/17/88
PP-4	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	91 ppm Diesel 91 ppm TPH	5/17/88
PP-5	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	48 ppm Diesel 48 ppm TPH	5/17/88
PP-6	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	2000 ppm Diesel 2000 ppm TPH	5/17/88
PP-7	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	ND Diesel ND TPH	5/17/88
PP-8	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	200 ppm Diesel 200 ppm TPH	5/17/88
PP-9	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	78 ppm Diesel 78 ppm TPH	5/17/88
PP-10	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	ND Diesel ND Gasoline	5/20/88
PP-11	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	83 ppm Diesel ND Gasoline	5/20/88
PP-12	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	92 ppm Diesel ND Gasoline	5/20/88
PP-14 and 15	Composite	GC/FID - TPH	ND Diesel 790 ppm Gasoline	5/23/88
PP-15	Samples from sides and bottom of excavation near UST 2 and 3	GC/FID - TPH	ND Diesel 490 ppm Gasoline	5/25/88

Table 5-1 (continued)

Sample ID	Sample Description	Analyses Performed	Analytical Results	Date Sampled
EXNBH-1	Composite soil sample from excavation around BH-1 location	GC/FID - TPH	ND for gas, kerosene and diesel	5/9/88
EXNUST-1	Composite soil sample from excavations near UST-1 (MW-3 borehole sample contamination remedial action)	GC/FID - TPH	ND for gas, kerosene and diesel - (did note one unidentifiable oil)	5/9/88
PNA-S	Soil from Burn-Pit area (near UST-1)	8270 - (incl. PNAs)	1.2 ppm Pyrene	5/23/88
PNA-W	Water from Burn-Pit area (near UST-1)	8270 - (incl. PNAs)	ND	5/23/88
PIT-DIS	Water accumulated in excavations around UST-1/MW-3 location, composited from 3 pits/trenches	GC/FID - TPH PCBs 413.2 - O&G Pb	2800 ug/l Total Fuel Hydrocarbons, heavier than #2 Diesel ND 2.0 ppm 1.1 ppm	5/9/88
D1	Composite of 8 soil samples from remediation pad D1 at 8 and 16 inches	Moisture GC/FID - TPH	14.0 percent ND Gasoline 250 ppm Diesel	6/10/88
D2	Composite of 7 soil samples from remediation pad D2 at 8 and 16 inches	Moisture GC/FID - TPH	11.6 percent 33 ppm Gasoline 200 ppm Diesel	6/10/88

Table 5-1 (continued)

Sample ID	Sample Description	Analyses Performed	Analytical Results	Date Sampled
G1	Composite of 7 soil samples from remediation pad G1 at 8 and 16 inches	Moisture 602 - BTX GC/FID - TPH	17.7 percent ND Benzene 0.0005 ppm Toluene 0.850 ppm Xylenes 570 ppm Gasoline 530 ppm Diesel	6/16/88
G2	Composite of 8 soil samples from remediation pad G2 at 8 and 16 inches	Moisture 602 - BTX GC/FID - TPH	17.6 percent ND Benzene 0.0015 ppm Toluene 0.013 ppm Xylenes 250 ppm Gasoline 720 ppm Diesel	6/16/88
G3	Composite of 8 soil samples from remediation pad G3 at 8 and 16 inches	Moisture 602 - BTX GC/FID - TPH	13.1 percent ND Benzene ND Toluene 0.021 ppm Xylenes 47 ppm Gasoline 180 ppm Diesel	6/16/88
G4	Composite of 8 soil samples from remediation pad G4 at 8 and 16 inches	Moisture 602 - BTX GC/FID - TPH	15.5 percent ND Benzene ND Toluene ND Xylenes 64 ppm Gasoline ND Diesel	6/16/88
G8	Composite of 8 soil samples from remediation pads G1 and G2 at 8 inches	Mod. 8015 - TFH 602 - BTX	ND Gasoline ND Kerosine ND Diesel ND Benzene ND Toluene 0.018 ppm Xylenes ND Ethyl-benzene	6/12/88
G16	Composite of 8 soil samples from remediation pads G1 and G2 at 16 inches	Mod. 8015 - TFH 602 - BTX	60 ppm Gasoline ND Kerosine ND Diesel 0.009 ppm Benzene 0.190 ppm Toluene 3.000 ppm Xylenes 0.750 ppm Ethyl-benzene	6/12/88

was encountered at a depth of approximately 3 feet, and oil slicks were observed seeping out from several locations around the perimeter. The eastern end of the trench was widened to 10 feet to investigate one of the oil seeps, however, no apparent primary source was discovered.

The second excavation was located approximately 10 feet west of the first. The trench measured approximately 10 feet by 10 feet by 6 feet deep. Again, groundwater was encountered at approximately 3 feet.

Both of the first two exploratory trenches encountered partially incinerated wood, old piers and other apparently creosoted wood, and assorted general refuse, all submerged and rotting in groundwater. The stench was nauseating. Because of the presence of charred wood, the area is believed to be a burn pit. The high groundwater is probably perched in an area prepared for the disposal and incineration of refuse. The time of deposition of the refuse is unknown.

The third exploratory trench was located near the southwest corner of the UST-1 location. The excavation measured approximately 10 feet by 10 feet by 6 feet. A minor amount (less than 10 cubic yards) of apparently diesel-contaminated soil was excavated and stockpiled for remediation.

A composite soil sample (EXNUST-1) was collected from the base and sides of the three trenches and submitted to a State-certified laboratory for analysis by GC/FID for TPH. The results indicated no detection of gasoline, diesel, or kerosene, however, one unidentified and unquantified oil was reported present in the sample. A second composite soil sample (PNA-S) was also collected from the three trenches and submitted for analysis by EPA method 8270 for base neutral compounds and polynuclear aromatic compounds. Pyrene was identified in the sample at 1.2 ppm.

A composite water sample (PNA-W) was collected from the three trenches and submitted for analysis by 8270 for base neutrals and polynuclear aromatic hydrocarbons. None of the analytes were detected. A second composite water sample was collected from the three trenches and analyzed for lead by GC/FID for total petroleum hydrocarbons, EPA methods 608 for PCBs and 413.2 for oil and grease to determine possibilities for

evacuation and disposal of the water. The results confirmed the presence of 2.8 ppm (2,000 ppb) total fuel hydrocarbons, 2.0 ppm oil and grease and 1.1 ppm lead. A summary of the analytical results are presented in Table 5-1, and the laboratory analytical reports and chain-of-custody records are included in Appendix A.

Soil Remediation by Landfarming

The preparation of remediation pad areas, movement of the stockpiled soil and aeration procedures were performed by Gradeway (a subcontractor of the construction contractor) according to the ES work plan for landfarm soil remediation. During the remediation process soil samples were collected and analyzed by ES.

Landfarming/biodegradation is one of the least expensive methods of on-site treatment of hydrocarbon-contaminated soil. The technique involves spreading the soil out in thin layers and aerating it by rototilling. Hydrocarbon concentrations are reduced by both evaporation and biodegradation. Because the contaminant was shown to be predominantly diesel, permits for aeration were not required by the Bay Area Air Quality Management District (Reference 15).

Maximizing the surface area of the soil is of primary importance for maximizing the aeration of hydrocarbons. Four remediation pads were constructed along the boundaries of the site in the area outside of the footprints of the proposed structure (Figure 5-1)

The remediation area pads were prepared according to specifications submitted to and approved by Elizabeth Rose of the Alameda County Department of Environmental Health, Division of Hazardous Materials (Reference 16). Soil excavated from the areas near UST-1 was moved to pad D1 for remediation. Diesel-contaminated soil from near UST-4 was moved to pad D2 for remediation. Gasoline and diesel contaminated soil from the main excavation near UST-2 and UST-3 areas was transferred to pads D3 and D4 for remediation.

On June 10, soil samples were collected from four random locations on pads D1 and D2 at depths of 8 inches and 16 inches from the surface.

At each sampling location, soil was excavated to the desired depth using a post-hole digger, and samples were collected in clean mason jars using a trowel. The top of each jar was covered with aluminum foil and tightly sealed, labelled, refrigerated, and delivered to a State-certified laboratory for analysis. The samples were composited in the laboratory into shallow (8 inches) and deep (16 inches) samples.

Soil samples were collected from pads D3 and D4 on June 16. Because of their larger areas, each was divided into two sections, with eight samples collected from each. Soil samples collected from each pad area were composited in the laboratory into shallow and deep samples and were analyzed by GC/FID for TPH.

Analytical results indicated further aeration would be necessary for pads D3 and D4. Concentrations were low enough in the samples from pads D1 and D2 for disposal of soil beneath the asphalt parking layer proposed for the site (Table 5-1). Laboratory analytical reports and chain-of-custody records are included in Appendix A.

All four remediation pads (D1 through 4) were tilled again for four weeks, once a week, for four hours. Samples were not collected from pads D1 and D2. The second confirmation sampling of pads D3 and D4 occurred on 12 July 1988. Samples were collected from four random locations on each of the pads at depths of 8 inches (for shallow composites) and 16 inches (for deep composites). The samples were composited in the laboratory and analyzed by GC/FID for TPH with extended analysis for BTX.

Analytical results on both samples confirmed concentrations of total petroleum hydrocarbons were sufficiently low to allow for on-site disposal beneath the proposed asphalt parking area. The results are summarized in Table 5-1. Laboratory analytical reports and chain-of-custody records are included in Appendix A.

UNDERGROUND STORAGE TANK CLOSURES

Engineering-Science monitored the removal of four underground storage tanks (USTs 1, 2, 3, and 4) from the Peterson Manufacturing

parcel on 7 April 1988. The tank excavations were performed by Erickson Incorporated. The locations of the tanks are shown in Figure 3-1.

All four tanks were constructed of steel with a capacity of 10,000 gallons. It was understood that the tanks were approximately 20 to 30 years old. The age of the tanks, their known historical usage, and results of the analysis performed on samples collected from them in October 1987 are summarized in Table 4-2.

UST Closure Procedures

The tanks were excavated in the presence of an Emeryville City fire inspector following all applicable fire code and health and safety guidelines. Prior to excavation, the flammable contents of each tank was pumped into labeled 55-gallon drums for hazardous materials disposal. A backhoe was then used to uncover the top of each tank, exposing the product fill and vent pipes. All pipes were disconnected and the open ends were capped or plugged.

Solid carbon dioxide (dry ice) was added to each of the emptied tanks to replace the lighter oxygen and reduce the concentration of flammable vapors in the tank. An explosimeter was used to confirm that the oxygen content and lower explosive limit (LEL) values were within the specified safety range.

With the tanks emptied and oxygen displaced, the backfill material along the sides of each tank was excavated, and the tank was chained and pulled from the ground by the backhoe. The excavated tanks were placed on plastic liners where they were steam-cleaned inside and out. All visible tank openings were plugged before loading each tank onto the truck. During the entire tank removal operation, air in the breathing zone was monitored for concentrations of hazardous vapors using a photoionization detector (Photo-Vac).

A copy of the approved Underground Tank Closure/Modification Plan, and manifests for the off-hauling of the four tanks are included in Appendix D. Manifests for the off-hauling of the tank contents and

rinseate are not included because this activity was not observed by Engineering-Science.

Confirmation Soil and Groundwater Sampling Procedures

According to California RWQCB recommendations for the evaluation and investigation of underground tanks, samples of soil and groundwater (if present) must be collected from each of the tank excavation pits at specified locations. These samples must be analyzed for detectable concentrations of the former tank contents to see if environmental contamination from tank leakages has occurred (Reference 8).

Two soil samples are required to be collected for tanks from 1,000- to 10,000-gallon capacity. The samples are to be collected from the soil beneath each end of the tank. If the bottom of the tanks are below the groundwater surface elevation, the samples must be collected from 6 inches above the water at each end of the tank pit. If there are visible signs of contamination in the excavation pit, the area should be sampled and analyzed for the presence of the former tank contents or other likely contaminants.

At the time the underground storage tanks were removed from the site (April 1988), the guidelines from the RWQCB for evaluating fuel leaks were as follows:

- Fuel hydrocarbon (gasoline or diesel) concentrations in excess of 1,000 ppm require excavation and disposal or treatment of soil;
- Fuel hydrocarbon concentrations between 100 and 1,000 ppm require groundwater evaluation and monitoring through the installation of monitoring wells; and
- Fuel hydrocarbon concentrations below 100 ppm require no further investigation or remediation.

If groundwater is present in the tank excavation pit, the water must be sampled and analyzed for possible contamination from the tank. If contamination is confirmed, the water must be evacuated from the pit and properly disposed of. If groundwater recharges into the pit, a

sample of the recharge must be collected and analyzed to determine if the contamination is localized or potentially widespread.

In addition to the requirements of the RWQCB, samples of groundwater were collected in order to facilitate disposal of the water removed from the pits prior to backfilling at the request of the construction geotechnical engineer. Because of the rapid recharge of groundwater into the excavations, the routine evacuation of water from the pits prior to backfilling was reconsidered and later discontinued.

Soil sampling protocol involved the use of a backhoe to collect a bucket full of native soil material from the appropriate sampling locations. Clean brass sampling tubes were driven into the relatively undisturbed native soil material then twisted gently to break contact and pulled out using a Vise-grip. Each end of the sampling tube was then covered with aluminum foil and plastic caps, labeled and refrigerated until delivered to a State-certified laboratory for analysis.

Groundwater samples were collected from each of the excavation pits using clean 1-liter glass bottles tied onto nylon strings. Any floating sludge or product layer present was avoided, if possible, or skimmed off from the water surface prior to sampling. The sampling bottles were then dropped from the sides of the excavations and immersed gently into the water.

The sample bottles were retrieved to the surface and samples of the groundwater from each of the tank excavation pits were poured into appropriate containers according to EPA sampling protocol. Each container was properly capped, labelled and preserved according to the proper protocol for the analytical methods intended. The samples were refrigerated and delivered to a State-certified laboratory for analysis.

A summary of soil and groundwater sampling locations, and analytical methods and results, are presented in Table 5-2. Laboratory analytical reports and chain-of-custody records are included in Appendix A.

Table 5-2
Analytical Results of Underground Storage Tank
Excavations: Soil and Groundwater Confirmation Samples
Wareham Development, Peterson Manufacturing Parcel

Tank Excavation	Sample ID	Sample Description	Analyses Performed	Analytical Results	Date Sampled
UST-1	HT-1	Soil sample from beneath west end of tank	8240 - VOCs 8080 - PCBs GC/FID - TPH	21 ppb C6 Hydrocarbons 78 ppb Arochlor PCB 35 ppm Diesel	4/7/88
	HT-2	Soil sample from beneath east end of tank	8240 - VOCs 8080 - PCBs GD/FID - TPH	6 ppb Xylene 500 ppb Hexane 43 ppb Arochlor 1260 PCB 26 ppm Diesel	4/7/88
	HT-3	Soil sample from wet area near ground surface near east edge of the pit	8240 - VOCs 8080 - PCBs GC/FID - TPH	112 ppb Xylene 2100 ppb Hexane ND 260 ppm Hydrocarbons	4/7/88
	UST-1SA	Additional soil sample from west end of pit approx. 6" above the water line.	8240 - VOCs 8080 - PCBs	170 ppb C6 Hydrocarbons ND	4/15/88
	UST-1W	Water sample from bottom of excavation	624 - VOCs 608 - PCBs	ND ND	4/15/88
	UST-1-WRE	Confirmation water sample from pit after purging	624 - VOCs 608 - PCBs GC/FID - TPH	ND ND 27 ppm	4/29/88
	UST-1WO	Oil from surface of water	608 - PCBs	ND	5/5/88

Table 5-2 (continued)

Tank Excavation	Sample ID	Sample Description	Analyses Performed	Analytical Results	Date Sampled
UST-2	UST-2SA	Soil sample collected from west end of excavation approx. 6" above water line	Mod. 8015 - TFH 8020 - BTX 8080 - PCBs	350 ppm Gasoline 150 ppb Benzene ND	4/12/88
	UST-2SB	Soil sample collected from east end of excavation approx. 6" above water line	Mod. 8015 - TFH 8020 - BTX	ND ND	4/12/88
	UST-2WA	Water sample collected from pit	602 - BTX	3,100 ppb Benzene 4,400 ppb Toluene 3,000 ppb Ethyl-Benzene 21,000 ppb Total Xylene	4/12/88
	UST-2WB	Water sample collected from pit	608 - PCBs	ND	4/15/88
	UST-2WRE	Water sample collected from pit after pumping dry	GC/FID - TPH 624 - VOCs 608 - PCBs	3.6 ppm TPH 810 ppb Benzene 1100 ppb Toluene 2200 ppb Total Xylene 3.1 ppb Arochlor 1254	4/27/88

Table 5-2 (continued)

Tank Excavation	Sample ID	Sample Description	Analyses Performed	Analytical Results	Date Sampled
UST-3	UST-3SA	Soil sample from west end of tank pit approx. 6" above water	Mod. 8015 - TFH 8020 - BTX 8080 - PCBs	170 ppm Diesel ND ND	4/12/88
	UST-3SB	Soil sample from east end of tank pit approx 6" above water	Mod. 8015 - TFH 8020 - BTX	ND ND	4/12/88
	UST-3WA	Water sample from bottom of pit	602 - BTX	1,100 ppb Benzene 640 ppb Toluene 1,200 ppb Ethyl-Benzene 7,000 ppb Total Xylenes	4/12/88
	UST-3WRE	Water sample from pit after purging	GC/FID - TPH 602 - BTX 608 - PCBs	13 ppm ND	4/27/88
UST-4	UST-4SA	Soil sample from north end of tank pit approx. 6" above water	Mod. 8015 - TFH 8020 - BTX	ND ND	4/12/88
	UST-4SB	Soil sample from south end of tank pit approx. 6" above water	Mod. 8015 - TFH 8020 - BTX	ND ND	4/12/88
	UST-4WA	Water sample from bottom of pit	602 - BTX	19 ppb Benzene 18 ppb Total Xylenes	4/12/88
	UST-4WS	Water sample with floating sludge from bottom of pit	GC/FID - TPH 608 - PCBs 624 - VOCs	2.7 ppm C14-C20 2.0 ppm Arochlor 1254 PCB ND	5/5/88

Underground Storage Tank-1 (UST-1). UST-1 was removed from the northwest corner of the Peterson Manufacturing parcel on April 7, 1988. Although the tank had recently passed a leak test, the eastern end of the tank was observed to be rusted when it was pulled from the ground.

The tank removal resulted in an open excavation measuring 35 feet (east to west) by 13 feet (north to south), by 11 feet deep. Approximately 2 feet of groundwater with a thin discontinuous layer of black oil and a brilliant surface sheen covered the bottom of the excavation.

Three soil samples (HT-1, HT-2, and HT-3) were collected from the UST-1 excavation pit immediately after the tank removal (7 April 1988). After equilibration of the groundwater in the excavation, a fourth sample (UST-1SA) was collected from 6 inches above the water level at the western (downgradient) end of the excavation. All four soil samples were submitted for analysis by EPA method 8240 for volatile organic compounds, and EPA method 8080 for PCBs. Samples HT-1, 2, and 3 were also submitted for analysis by modified EPA method 8015 for total fuel hydrocarbons.

Sample HT-1, collected from native soil beneath the eastern end of the tank (below the groundwater equilibration level), was found to contain 21 ppb hexane, 78 ppb Arochlor 1260 (PCB) and 35,000 ppb diesel. Sample UST-1SA, collected from native soil six inches above the equilibrated groundwater level was found to contain 170 ppb hexane. PCBs were non-detected, and fuel hydrocarbons were not tested. Sample HT-2, collected from below the groundwater equilibration level beneath the eastern end of the tank, was found to contain 6 ppb xylene, 500 ppb hexane, 43 ppb arochlor 1260 (PCB), and 26,000 ppb diesel. Sample HT-3, collected from the eastern end of the pit below the leaking connecting pipeline, was found to contain 112 ppb xylene, 2,100 ppb hexane, and 260,000 ppb fuel hydrocarbons. No PCBs were detected.

Although the results indicate that contamination of the soil has occurred around UST-1, contaminant levels measured do not explicitly require soil excavation and disposal or treatment.

On 15 April 1988, a groundwater sample was collected from the tank excavation pit and submitted for analysis by EPA methods 624 for volatile organic compounds, and 608 for PCBs. None of the analytes tested were detected. The water was evacuated from the pit by Erickson Trucking, Inc. on 24 May 1988. A copy of the manifest is included in Appendix D.

A sample of the recharge water was collected on 29 April and submitted for analysis by EPA methods 624 for volatile organic compounds, 608 for PCBs and modified 8015 for total fuel hydrocarbons. Of the analytes tested, 27,000 ppb (27 ppm) fuel hydrocarbons were detected. The black oil slick was also visible on the recharge water, therefore it was sampled (UST-1WO) on 5 May and analyzed by EPA method 608 for PCBs. None were detected (Table 5-2).

Underground Storage Tank-2 (UST-2). UST-2 was the northernmost of the two underground fuel storage tanks located in the fuel pump island area near the center of the project site. As it was removed from the excavation, the eastern end of the tank was observed to be leaking. The tank removal resulted in an open excavation measuring approximately 35 feet (east to west) by 13 feet (north to south), by 11 feet deep. Approximately 3 to 4 feet of yellow groundwater was observed at the bottom of the excavation.

Samples were collected on 12 April 1988 from native soil, six inches above the equilibrated water level at the eastern (UST-2SA) and western (UST-2SB) ends of the excavation. Both samples were submitted to a State-certified laboratory for analysis by EPA methods 8020 for aromatic volatile organics, and modified 8015 for total fuel hydrocarbons. UST-2SA was also submitted for analysis by EPA method 8080 for PCBs.

Sample UST-2SA was found to contain 350 ppb gasoline and 150 ppb benzene. Sample UST-2SB did not contain any of the analytes tested in concentrations above detection limits. These results indicate the presence of soil contamination but not at sufficient levels to warrant soil excavation and disposal or treatment, based on the accepted RWQCB guidelines at that time.

Two samples of groundwater were collected from the excavation after the tank was removed. Sample UST-2WA was collected on 12 April 1988 and submitted to a State-certified laboratory for analysis by EPA method 602 for aromatic volatile organics. Sample UST-2WB was collected on 15 April and submitted for analysis by EPA method 608 for PCBs. After the water was evacuated from the excavation, a sample of the recharge water, UST-2WRE, was collected and submitted for analysis by EPA methods 624 for volatile organic compounds, 608 for PCBs and modified 8015 for total petroleum hydrocarbons.

Sample UST-2WA was found to contain 3,100 ppb benzene, 4,400 ppb toluene, 3,000 ppb ethylbenzene, and 21,000 ppb total xylene. Sample UST-2WB did not contain concentrations of PCBs above the detection limits. However, the groundwater recharge sample, UST-2WRE, was found to contain 3,600 ppb total petroleum hydrocarbons, 810 ppb benzene, 1,100 ppb toluene, 2,200 ppb total xylene, and 3.1 ppb of arochlor 1254 (PCB). These results indicate that groundwater degradation has occurred in the vicinity of UST-2 presumably due to leakage from the tank.

Underground Storage Tank-3 (UST-3). UST-3 was the southernmost of the two adjacent tanks located in the fuel pump island area near the center of the site. When pulled from the ground, the tank appeared intact with no visible evidence of tank leakage. The two to three feet of groundwater remaining at the bottom of the excavation, however, was covered with a black film and hydrocarbon sheen.

The tank excavation was similar in size to that of UST-2. The two excavations remained separated by a wall of earth approximately three feet wide at the ground surface level. Soil samples were collected from native soil at the western (UST-3SA) and eastern (UST-3SB) ends of the excavation, approximately six inches above the equilibrated water level. Both samples were submitted to a State-certified laboratory for analysis by EPA methods 8020 for aromatic volatile organics, and modified 8015 for total fuel hydrocarbons. Sample UST-3SA was also analyzed for PCBs by EPA method 8080. Diesel was detected in sample UST-3SA at a concentration of 170 ppm (170,000 ppb). The remaining analytes were non-detected.

The results confirm soil contamination at the western end of the tank excavation, but at a level insufficient to warrant soil excavation and disposal or treatment (Reference 8).

A sample of groundwater (UST-3WA) was collected from the excavation pit on 12 April 1988, five days after the removal of the tank. The sample was submitted to a State-certified laboratory for analysis by EPA method 602 for aromatic volatile organics. The sample was found to contain 1,100 ppb benzene, 640 ppb toluene, 1,200 ppb ethylbenzene, and 7,000 ppb total xylene. The water was evacuated from the pit and a sample of the recharge water (UST-3WRE) was collected on 27 April. This sample was submitted to a State-certified laboratory for analysis by EPA methods 602 for aromatic volatile organics, 608 for PCBs, and modified 8015 for total petroleum hydrocarbons. Of all the analytes tested, 13 ppm (13,000 ppb) total petroleum hydrocarbons were confirmed present.

Underground Storage Tank-4 (UST-4). Tank UST-4 was located approximately 20 feet southeast of the boiler room, and approximately 50 feet southwest of the fuel pump island. The tank was removed on 12 April 1988, and appeared intact with no evidence of content leakage. The tank removal resulted in an excavation measuring approximately 13 feet (east to west), by 35 feet (north to south) by 11 feet deep. Approximately 1.5 feet of groundwater was present at the bottom of the excavation.

Soil samples were collected from native soil approximately 6 inches above the equilibrated groundwater level at the northern (UST-4SA) and southern (UST-4SB) ends of the excavation. Both samples were submitted to a State-certified laboratory for analysis by EPA methods 8020 for aromatic volatile organics, and modified 8015 for total fuel hydrocarbons. All analytes were below detection limits in both samples.

A sample of groundwater was collected from the excavation on 12 April, and was submitted for analysis by EPA method 602 for aromatic volatile organics. Of the analytes tested, 19 ppb benzene and 18 ppb total xylenes were confirmed present. The water was not evacuated from the pit.

On 5 May 1988, the deep water well nearby (Figure 3-1) was cleared by jetting water through a rotary drill stem. During the well clearing activity, a green-brown sludge appeared on the surface of the groundwater in the UST-4 excavation. A sample was collected (UST-4WS) and submitted for analysis by EPA methods 608 for PCBs, 624 for volatile organic compounds, and modified 8015 for total fuel hydrocarbons. Of the analytes tested, 2.7 ppm (2,700 ppb) diesel oil, and 2.0 ppm (2,000 ppb) arochlor 1254 (PCB) were confirmed present. All other analytes were non-detected.

MONITORING WELL CLOSURES

Two monitoring wells, MW-1 and MW-3, were abandoned by Datum Exploration, subcontractors to Plant Reclamation, on 11 February 1988. According to Plant Reclamation, the wells were abandoned according to Engineering-Science specifications (Reference 8). A closure report was not provided to ES. Monitoring well MW-2 remains intact at the site.

WATER WELL CLOSURE

On 12 May 1988, the steel casing of the well was ripped from the bottom of the well to within six feet of the top with a mills knife. Six cuts per linear foot were made around the circumference of the casing. Neat cement was then tremied to the bottom of the well, filling it as the tremie pipe was extracted. The weight of the column of cement was expected to force the cement through the knifed openings into the gravel pack of the well. Once filled, the tremie pipe was removed and the cement was allowed to settle.

SECTION 6
CONCLUSIONS

The following conclusions are based on analytical data acquired at the Wareham Development Group parcel at 1600-63rd Street in Emeryville, during site investigation activities performed since December 1986.

SOIL CONTAMINATION

- Locations of soil samples identified as containing concentrations of total petroleum hydrocarbons over 1,000 parts per million (ppm) have been excavated, remediated, and disposed of on-site.

- Unexcavated soil with waste oil and diesel concentrations from 16 to 120 ppm remain in place at locations BH-7 (20 ppm diesel), BH-9a (16 ppm diesel), EB-3 (120 ppm waste oil), and EB-6 (190 ppm waste oil) (Figure 3-1).

- Unexcavated soil with gasoline and diesel concentrations from 83 to 790 ppm remain in place at locations PP-11 (83 ppm diesel), PP-12 (92 ppm diesel) (Figure 5-4), PP-14 (790 ppm gasoline), and PP-15 (490 ppm gasoline) (Figure 5-5).

- A composite surface soil sample contained 42 ppm PCBs (arochlor 1260) and 20 ppm petroleum hydrocarbons, although it is not known whether the identified contamination is from a single hot spot or is general low level surface soil contamination over the entire site.

- Near surface soils contained areas of minor accumulations of tarry bitumen, a relatively non-mobile substance containing

petroleum hydrocarbons (43,000 ppm), lead (440 ppm), xylene, and various polynuclear aromatic hydrocarbons.

- A fill area has been identified in shallow (three to six feet) subsurface soils at the western end of the site. The area contains partially burned and rotting refuse, including plastics and what appear to be creosoted timbers and pier pilings. The fill material is saturated with shallow perched groundwater and contain various types and concentrations of PNAs.

- Remediated soil with concentrations of 60 ppm total petroleum hydrocarbons have been disposed of in a single six-inch lift, on-site beneath the asphalt parking area.

- It is possible that local areas (hot spots) of soil containing TPH, PNAs, PCBs, metals, etc. may exist as yet undetected at this site.

UNDERGROUND STORAGE TANKS

- All four remaining underground storage tanks were removed from the site according to accepted RWQCB protocol.

- Unexcavated soil in the vicinity of UST-1 exhibits low levels of a C6 hydrocarbons (possibly hexane at 0.021 ppm), arochlor 1260 PCB (0.078 ppm) and diesel (35 ppm) at the west end of the former tank pit below the level of groundwater; from C6 hydrocarbons (probably hexane at 0.170 ppm) at the west end of the former tank pit six inches above the level of groundwater; from hexane (0.500 ppm), arochlor 1260 PCB (0.043 ppm) and diesel (26 ppm) at the east end of the former tank location; and from hexane (2.100 ppm) and petroleum hydrocarbons (260 ppm) in near surface soils at the east end of the former tank location.

- Groundwater seepage into the UST-1 excavation exhibited a floating black oil product consisting of petroleum hydrocarbons (27 ppm). VOCs and PCBs were not present, and the floating oil also tested negative for PCBs.

- Unexcavated soil remaining in place at the west end of the former location of UST-2 exhibits low levels of gasoline (350 ppm) and benzene (0.15 ppm).

- Groundwater seepage into the UST-2 excavation exhibited low levels of petroleum hydrocarbons (3.6 ppm), benzene (0.81 ppm), toluene (1.10 ppm), total xylenes (2.20 ppm) and arochlor 1254 PCB (0.0031 ppm).

- Unexcavated soil remaining in place at the west end of the former location of UST-3 exhibits a low level of fuel hydrocarbon contamination (170 ppm diesel).

- Groundwater seepage into the UST-3 excavation exhibited a low level of petroleum hydrocarbons (13 ppm).

- Groundwater seepage into the UST-4 excavation exhibited low levels of fuel hydrocarbons and PCBs (2.7 ppm C14 to C20 petroleum hydrocarbons, and 2.0 ppm arochlor 1254 PCB).

GROUNDWATER HYDROLOGY AND HYDROCHEMISTRY

- Areas of perched groundwater beneath the western end of the project site made it impossible to determine the gradient of groundwater flow with only the three wells installed. The direction of flow is roughly due west.

- Perched groundwater in the buried refuse area in the western portion of the site lies at approximately 3 feet below the ground surface.

- The depth to groundwater beneath the site is for the most part from 6 to 8 feet.

- Groundwater from monitoring well MW-1 exhibits low levels of fuel hydrocarbon contamination (21 ppm total fuel hydrocarbons, 1.7 ppm benzene, 2.6 ppm toluene, and 4.2 ppm total xylenes). Lead contamination was minor (0.031 ppm). PCBs, PNAs and other metals were not analyzed.

- Groundwater from well MW-2 exhibits moderate levels of animal fat, oil, and grease contamination (200 ppm total oil and grease). This material is unregulated. PCBs, PNAs, VOCs and metals were not analyzed.

- Groundwater from well MW-3 exhibits low levels of fuel hydrocarbon contamination (2.7 ppm total fuel hydrocarbons). PCBs were nondetected, and PNAs and metals were not analyzed.

ABOVE GROUND STORAGE TANKS

- All above ground storage tank contents identified as containing hazardous substances were disposed of by the previous site owner (Peterson Manufacturing). All tanks have been emptied and destroyed under the direction of Plant Reclamation. Details concerning the tank destruction and disposal of contents was not made available to ES.

SUMPS

- All sumps were emptied and destroyed, and their contents disposed of under the direction of Plant Reclamation.

WATER WELL

- The water well has been cemented closed according to RWQCB guidelines (Reference 17), and Santa Clara Valley Water District recommendations (Reference 18).

- Groundwater in the well contained fuel hydrocarbons, PCBs, VOCs, and PNAs at depths of up to 350 feet.

- The origin of the 24 feet of floating PCB-laced product which was removed from the well, is not known.

- Fuel hydrocarbon and PCB contamination identified at the 300- to 350-foot level may have been introduced through the open well in which 24 feet of floating petroleum product containing PCBs was

identified. PNA contamination may have originated from contaminants buried in soil at the site.

SECTION 7
RECOMMENDATIONS

The following recommendations are based on the analytical results of site characterization activity, and regulatory agency guidelines for the investigation and remediation of soil and groundwater contamination.

- Further characterize shallow groundwater contamination by installing four additional monitoring wells. One well should be installed along the eastern property line (the presumed upgradient location), and a second should be installed along the north wall of the new structure, as close as possible to the abandoned water well and Location A excavation area. A third well should be installed within 10 feet downgradient (presumably west) of the UST-1/MW-3 location, and a fourth within 10 feet downgradient (presumably west) of the borehole EB-6 location.

- Soil samples collected during well installations, with any visual (or other) signs of contamination should be submitted to a State-certified laboratory for analysis by EPA method modified 8015 for total fuel hydrocarbons, 8080 for PCBs, 8270 for base neutral compounds and polynuclear aromatics (PNAs), 8240 for aromatics and volatile organic compounds (VOCs), GC/FID for waste oil, and metals analysis for lead.

- Monitoring well elevations should be surveyed, and groundwater elevations measured, to identify areas of perched groundwater and to determine the local groundwater gradient.

- Groundwater samples should be collected from all five monitoring wells on a quarterly basis for one year. Samples should be

analyzed by modified EPA method 8015 for total fuel hydrocarbons, methods 608 for PCBs, 8270 for base neutral compounds and PNAs, 624 for aromatics and VOCs, GC/FID for waste oil, and metals analysis for lead.

- At the end of one year of quarterly sampling, a report should be submitted to the Alameda County Department of Environmental Health, the State Department of Health Services in Emeryville, and the Bay Area Regional Water Quality Control Board office in Oakland.

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APPENDIX A

ANALYTICAL REPORTS AND CHAIN OF CUSTODY RECORDS

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan B. McCullar	NC065

PROJECT NAME / LOCATION: WAREHAM PETERSON

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	MOD. 8015	8020 (BTX)				PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
G2D-8	July 12	2:30	Soil	Remediation Pad G1&G2	1							*	Composite all the
G2D-16	"	2:33	"		1							□	samples with
G2C-8	"	2:37	"		1							*	names having
G2C-16	"	2:40	"		1							□	extension 8 e.g.
G2B-8	"	2:43	"		1							*	G2D-8 and to
G2B-16	"	2:45	"		1							□	composite all
G2A-8	"	2:48	"		1							*	samples with
G2A-16	"	2:51	"		1							□	names having
G1D-8	"	2:57	"		1							*	extension -16 for
G1D-16	"	3:00	"		1							□	example G2D-16.
G1C-8	"	3:05	"		1							*	Run both of these
G1C-16	"	3:08	"		1							□	samples for
G1B-8	"	3:11	"		1							*	MOD 8015, and
G1B-16	"	3:14	"		1							□	8020 (BTX).
G1A-8	"	3:17	"		1							*	Results needed in 48 hrs.

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	July 12/88				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS

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ENGINEERING – SCIENCE, INC.
CHAIN OF CUSTODY RECORD

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan B. McCullar	NC065

PROJECT NAME / LOCATION: WAREHAM PETERSON

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: Mod. 8015	ANALYSES REQUIRED: 8020 (BTX)	ANALYSES REQUIRED	ANALYSES REQUIRED	ANALYSES REQUIRED	ANALYSES REQUIRED	PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
G1A-16	"	3:20	"	Remediation Pads	1								☐	See page 1

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	July 12				

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CLIENT: ENGINEERING SCIENCE
JOB #: NC065, WAREHAM PETERSON

DATE RECEIVED: 07/13/88
DATE EXTRACTED: 07/13/88
DATE ANALYZED: 07/13/88
DATE REPORTED: 07/15/88

Results of Analysis for Petroleum Hydrocarbons in Soils & Wastes

Method References: TPH: Total Petroleum Hydrocarbons, EPA 3550/8015

LAB ID	COMPOSITE ID	GASOLINE (mg/kg)	KEROSINE (mg/kg)	DIESEL (mg/kg)	OTHER * (mg/kg)
15113-1--8	G2D-8,G2C-8 G2B-8,G2A-8 G1D-8,G1C-8 G1B-8,G1A-8	ND(10)	ND(10)	ND(10)	*
15113-9--16	G2D-16,G2C-16 G2B-16,G2A-16 G1D-16,G1C-16 G1B-16,G1A-16	60	ND(10)	ND(10)	*

*CONTAINS UNIDENTIFIABL OIL NOT QUANTIFIABLE BY GC.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

Duplicate: Relative % Difference	9
Spike: % Recovery	96

LABORATORY DIRECTOR

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LABORATORY NUMBER: 15113-1--8
CLIENT: ENGINEERING SCIENCE
Job #: NC065, WAREHAM PETERSON
COMPOSITE ID: G2D-8,G2C-8,G2B-8,G2A-8
G1D-8,G1C-8,G1B-8,G1A-8

DATE RECEIVED: 07/13/88
DATE ANALYZED: 07/13/88
DATE REPORTED: 07/15/88

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene	ND	5
Toluene	ND	5
Ethyl Benzene	ND	5
Total Xylenes	18	5
Chlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5
1,3-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference	5
Average Spike Recovery %	99

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LABORATORY NUMBER: 15113-9--16
CLIENT: ENGINEERING SCIENCE
Job #: NC065, WAREHAM PETERSON
COMPOSITE ID: G2D-16,G2C-16,G2B-16,G2A-16
G1D-16,G1C-16,G1B-16,G1A-16

DATE RECEIVED: 07/13/88
DATE ANALYZED: 07/13/88
DATE REPORTED: 07/15/88

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene	9	5
Toluene	190	5
Ethyl Benzene	750	5
Total Xylenes	3,000	5
Chlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5
1,3-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference	5
Average Spike Recovery %	99

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD 695-1

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065.

PROJECT NAME / LOCATION: WAREHAM PETERSON.

SAMPLER(S): (SIGNATURE) Ajay Singh.

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: TPH (GC-FID)	PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
G1A-8	June16		Soil	Remediation Pad	1		X		Call the
G1A-16	June16		〃	:G1	1		X		composite of
G1B-8	June16		〃		1	✓	X		all G1's as
G1B-16	June16		〃		1		X		G1-COM and
G1C-8	〃		〃		1		X		analyse the comp.
G1C-16	〃		〃		1		X		for GC-FID.
G1D-8,16	〃		〃		1		X		(seven samples to one)
G2A-8	〃		〃	Remediation Pad	1		✓		Call the composite
G2A-16	〃		〃	G2.	1		✓		of all G2's as
G2B-8	〃		〃		1		✓		G2-COM and
G2B-16	〃		〃		1	✓	✓		analyse the
G2C-8	〃		〃		1		✓		composite for
G2C-16	〃		〃		1		✓		GC-FID.
G2D-8	〃		〃		1		✓		(eight samples
G2D-16	〃		〃		1		✓		to 1)

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	June16 11:58				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bell Freeman	6/16/88 11:58	rec'd cold & intact

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ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD 695-2

CLIENT: ENGINEERING-SCIENCE, INC. BERKELEY

PROJECT MANAGER: Dan McCullar

PROJ. NO.: NC065.

PROJECT NAME / LOCATION: WAREHAM PETERSON

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: TPH GC-FID	PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
G3A-8	June 15		Soil	Remediation Pad G3.	1		0		Call the Composite
G3A-16	"		"		1		0		of all G3's as
G3B-8	"		"		1		0		G3-com and
G3B-16	"		"		1	✓	0		Analyse the
G3C-8	"		"		1		0		composite for
G3C-16	"		"		1		0		GCFID.
G3D-8	"		"		1		0		(8 samples to 1).
G3D-16	"		"		1		0		
G4A-8	"		"	Remediation Pad	1		+		Call the Composite
G4A-16	"		"	G4.	1		+		of all G4's as
G4B-8	"		"		1		+		G4-com and
G4B-16	"		"		1	✓	+		analyse the
G4C-8	"		"		1		+		composite for
G4C-16	"		"		1		+		GC FID.
G4D-8	"		"		1		+		(8 samples to 1).

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	June 16 12:07				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Friedman	6/16/88 12:07	rec'd cold & intact

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ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD 695-3

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065.

PROJECT NAME / LOCATION: Wareham Peterson

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: TPH (GC-FID)						PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
G4D-16	June 16		Soil	Remediation Pad G4	1	–						+		See instructions on page 2.

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	June 16 12:07				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Friedman	6/16/88 12:07	rec'd cold & intact

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ES
ENGINEERING-SCIENCE, INC.

600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 548-7970

Job No.: NC065.01

Client: ES Berkeley
Attention: Dan McCullar

Project: Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 6-16-88.

Sample Preparation Data

Laboratory Sample No.	Client Sample ID	Test	Date collected	Date* extracted	Date analyzed	Date* 2nd col.
88061102	G1-COM	BTX	6-16-88		6-21-88	
88061102	G1-COM	GCFID	6-16-88	6-16-88	6-22-88	
88061103	G2-COM	BTX	6-16-88		6-21-88	
88061103	G2-COM	GCFID	6-16-88	6-16-88	6-22-88	
88061104	G3-COM	BTX	6-16-88		6-21-88	
88061104	G3-COM	GCFID	6-16-88	6-16-88	6-22-88	
88061105	G4-COM	BTX	6-16-88		6-21-88	
88061105	G4-COM	GCFID	6-16-88	6-16-88	6-22-88	

* If applicable

DETECTION LIMITS
ENVIRONMENTAL QUALITY PARAMETERS
SAMPLES NO.: 88061102-88061105

Parameter	Units	Detection Limits
Benzene	ug/KG	0.2
Toluene	ug/KG	0.2
Xylene	ug/KG	0.4

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

DETECTION LIMITS
FID SCAN
SAMPLES NO.: 88061102-88061105

Compound	Detection Limits
Petroleum Hydrocarbons	
#2 Diesel	10,000 ug/KG
Gasoline	10,000 ug/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ANALYSIS REPORT

WORK ORDER NUMBER: 695
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 06/16/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY-PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 3, UNITS: NA

TEST COMPOUND	G1-COM 6-16-88 88061102	G2-COM 6-16-88 88061103	G3-COM 6-16-88 88061104	G4-COM 6-16-88 88061105
% MOISTURE	17.7	17.6	13.1	15.3

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 695

TASK: 4, UNITS: ug/KG, GROUP BTX

TEST COMPOUND	G1-COM 6-16-88 88061102	G2-COM 6-16-88 88061103	G3-COM 6-16-88 88061104	G4-COM 6-16-88 88061105
BENZENE	ND	ND	ND	ND
TOLUENE	5.0	1.5	ND	ND
XYLENES	850	13	21	ND

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 695

TASK: 4, UNITS: ug/KG, GROUP GCFID

TEST COMPOUND	G1-COM 6-16-88 88061102	G2-COM 6-16-88 88061103	G3-COM 6-16-88 88061104	G4-COM 6-16-88 88061105
#2 DIESEL	520000	720000	180000	ND
GASOLINE	570000	250000	47,000	64,000

ND - Not Detected

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065

PROJECT NAME / LOCATION: Wareham Peterson

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: GC-FID (Diesel)	PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
D1A-8	June 10, 88		Soil	Remediation		✓	X	X	Call the
D1A-16	"		"	Pad D1		✓	X	X	Composite
D1B-8	"		"			✓	X	X	D1-Com.
D1B-16	"		"			✓	X	X	Analyse
D1C-8	"		"			✓	X	X	Composite
D1C-16	"		"			✓	X	X	Sample for
D1D-8	"		"			✓	X	X	GC-FID (DIESEL)
D1D-16	"		"			✓	X	X	
D2A-8	"		"	Remediation		✓	X	X	2 week turnaround
D2A-16	"		"	Pad D2		✓	X	✓	
D2B-8	"		"			✓	X	✓	Call the
D2B-16	"		"			✓	X	✓	- Composite
D2C-8	"		"			✓	X	✓	D2-Com
D2D-8	"		"			✓	X	✓	Analyse for
D2D-16	"		"			✓	X	X	GC-FID(DIESEL)

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	June 10 5:25				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Trudeau	6-10-88 17:25	rec'd intact

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ES
ENGINEERING-SCIENCE, INC.

600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 548-7970

Job No.: NC065.01

Client: ES Berkeley

Attention: Dan McCullar

Copy: Rick Makdisi

Project: Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 6-13-88.

Sample Preparation Data

Laboratory Sample No.	Client Sample ID	Test	Date collected	Date* extracted	Date analyzed	Date* 2nd col.
88061073	D1-COM	MOIS	6-10-88		6-15-88	
88061073	D1-COM	GCFID	6-10-88	6-13-88	6-22-88	
88061074	D2-COM	MOIS	6-10-88		6-15-88	
88061074	D2-COM	GCFID	6-10-88	6-13-88	6-22-88	

* If applicable

DETECTION LIMITS
FID SCAN
SAMPLES NO.: 88061073-88061074

Compound	Detection Limits
Petroleum Hydrocarbons	
#2 Diesel	10,000 ug/KG
Gasoline	10,000 ug/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING SCIENCE INC.
06/23/88

ANALYSIS REPORT

WORK ORDER NUMBER: 687
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 06/13/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548 7970

TASK: 3, UNITS: NA

TEST COMPOUND	D1-COM. 6-10-88 88061073	D2-COM. 6-10-88 88061074
% MOISTURE	14.0	11.6

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 687

BASE: 4, UNITS: ug/KG, GROUP GCFID

TEST COMPOUND	D1-COM. 6-10-88 88061073	D2-COM. 6-10-88 88061074
#2 DIESEL	250000	200000
GASOLINE	ND	33,000

ND - Not Detected

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065.

PROJECT NAME / LOCATION: WAREHAM PETERSON.

SAMPLER(S): (SIGNATURE)

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: GC-FID (TPH)						PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
PP-14	May23	1:30	Soil	Main Pit	1	✓						X	X	24 hrs Rush.
PP-15	May23	1:35	Soil		1	✓						X	X	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	May23 1:45				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		[signature]	5/23 1:45	received cold & intact

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ES
ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01
Client: ES Berkeley
Attention: Dan McCullar
Copy: Rick Makdisi
Project: Peterson Manufacturing

Attached are the analytical reports for the soil sample received by this laboratory on 5-23-88.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88050982	GCFID	5-23-88	1:30-1:35	5-23-88	5-23-88	

* If applicable

Detection Limits
FID Scan
Sample No.: 88050982

Compound	Detection
Petroleum Hydrocarbons	
#2 Diesel	10,000 ug/Kg
Gasoline	10,000 ug/Kg

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ANALYSIS REPORT

WORK ORDER NUMBER: 655
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 05/23/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 4, UNITS: ug/KG, GROUP GCFID

TEST COMPOUND	MAIN PIT COMPOS 5-23-88 88050982
#2 DIESEL	ND
GASOLINE	790000

ND - Not Detected

ENGINEERING SCIENCE INC.

PAGE 1

REMITTANCE ADDRESS:
ENGINEERING SCIENCE INC.

FILE 91849
LOS ANGELES, CA 90074-1849
(415)-841-7353

INVOICE NUMBER: 596
JOB NUMBER : ZB0000000360
ES CLIENT :
INVOICE DATE : 05/26/88
WORK ORDER : 655

BILL TO:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT ADDRESS:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TEST CODE	NUMBER OF TESTS	PRICE	TOTAL
GCFID	1	100.00	100.00
MOIS	1	0.00	0.00
		TEST TOTAL	100.00

MISC. CHARGE	UNITS	PRICE	TOTAL
RUSH	1	100.00	100.00
COMPOSITE	1	15.00	15.00
		SUBTOTAL	215.00

LABOR	0.00
SHIPPING	0.00
MATERIALS	0.00
TOTAL DUE	215.00

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made in writing. Hazardous samples will be returned to client or disposed of at client expense.

SOIL SAMPLE

88050982 Main Pit Compos 5-23-88

ES
ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01

Client: ES Berkeley

Attention: Dan McCullar

Copy: Rick Makdisi

Project: Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 5-24-88.

Sample Preparation Data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88051002	GCFID	5-23-88	Not Given	5-24-88	5-25-88	

* If applicable

DETECTION LIMITS
FID SCAN
SAMPLE NO.: 88051002

Compound	Detection Limits
Petroleum Hydrocarbons	
#2 Diesel	10,000 ug/KG
Gasoline	10,000 ug/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING SCIENCE INC.
05/26/88

ANALYSIS REPORT FOR WORK ORDER NUMBER 662

TASK: 4, UNITS: ug/KG, GROUP GCFID

TEST COMPOUND	FP-15 MAIN EXCV FIT 5-23-88 88051002
#2 DIESEL	ND
GASOLINE	490000

Laboratory Supervisor

ND - Not Detected

ANALYSIS REPORT

WORK ORDER NUMBER: 662
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 05/24/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 3, UNITS: NA

TEST COMPOUND	PP-15 MAIN EXCV PIT 5-23-88 88051002
% MOISTURE	NA

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD 659

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCallar	NC065.

PROJECT NAME / LOCATION: WAREHAM PETERSON

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: 8270						PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
PNA-S	May 23	2:45	Soil	Pit Near UST-1	1	✓						No	No	24 hrs Rush
PNA-W	May 23	2:46	Water		1	✓						"	"	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	May 24/88 2:45				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Friedman	5/24/88 14:45	rec'd cold & intact

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ENGINEERING SCIENCE
Priority Pollutant Analysis
Base Neutrals - SW 8270
Matrix: Water

Date Received: May 24, 1988
Date Reported: May 27, 1988

Work Order: 660
Job No. : NC065

FOR: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88051000
Sample No.:	PNA-Water
Date Sampled:	5-24-88
Time Sampled:	14:45
Date Extracted:	5-24-18
Date Analyzed:	5-25-88

Compound	Detection Limits ug/L	ANALYTICAL RESULTS ug/L
,3-Dichlorobenzene	10	ND
,4-Dichlorobenzene	10	ND
Hexachloroethane	10	ND
is(2-chloroethyl)ether	10	ND
,2-Dichlorobenzene	10	ND
N-Nitrosodimethylamine	10	ND
Bis(2-chloroisopropyl)ether	10	ND
-Nitrosodi-n-propyl amine	10	ND
exachlorobutadiene	10	ND
1,2,4-Trichlorobenzene	10	ND
itrobenzene	10	ND
sophorone	10	ND
Naphthalene	10	ND
is(2-chloroethoxy)methane	10	ND
-Chloronaphthalene	10	ND
Hexachlorocyclopentadiene	10	ND
Acenaphthylene	10	ND
cenaphthene	10	ND
imethyl phthalate	10	ND
2,6-Dinitrotoluene	10	ND
luorene	10	ND
,4-Dinitrotoluene	10	ND
Diethyl phthalate	10	ND
N-Nitrosodiphenylamine	10	ND
exachlorobenzene	10	ND

Priority Pollutant Analysis
Base Neutrals - SW 8270
Matrix: Water
(continued)

Date Received: May 24, 1988
Date Reported: May 27, 1988

Work Order: 660
Job No. : NC065

FOR: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88051000
Sample No.:	PNA-Water
Date Sampled:	5-24-88
Time Sampled:	14:45
Date Extracted:	5-24-18
Date Analyzed:	5-25-88

Compound	Detection Limit ug/L	ANALYTICAL RESULTS ug/L
Phenanthrene	10	ND
Anthracene	10	ND
Dibutyl phthalate	10	ND
Fluoranthene	10	ND
4-Chlorophenyl phenyl ether	10	ND
Pyrene	10	ND
Butyl Benzyl phthalate	10	ND
Bis(2-ethylhexyl) phthalate	10	ND
Chrysene	10	ND
4-Bromophenyl phenyl ether	10	ND
Benzo(a)anthracene	10	ND
Di-n-octylphthalate	10	ND
Benzo(b)fluoranthene	10	ND
Benzo(k)fluoranthene	10	ND
Benzidine	60	ND
3,3'-Dichlorobenzidine	20	ND
Benzo(a)pyrene	10	ND
Indeno(1,2,3-cd)pyrene	10	ND
Dibenzo(a,h)anthracene	10	ND
Benzo(ghi)perylene	10	ND
Benzyl Alcohol	20	ND

Lana Kuck
Analyst

for Ron Buxton
Laboratory Supervisor

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING SCIENCE
Priority Pollutant Analysis
Base Neutrals - SW 8270
Matrix: Soil

Date Received: May 24, 1988
Date Reported: May 27, 1988

Work Order: 660
Job No. : NC065

FOR: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88050999
Sample No.:	PNA-Soil
Date Sampled:	5-24-88
Time Sampled:	14:46
Date Extracted:	5-24-18
Date Analyzed:	5-25-88

Compound	Detection Limits mg/kg	ANALYTICAL RESULTS mg/kg
1,3-Dichlorobenzene	0.66	ND
1,4-Dichlorobenzene	0.66	ND
Hexachloroethane	0.66	ND
Bis(2-chloroethyl)ether	0.66	ND
1,2-Dichlorobenzene	0.66	ND
N-Nitrosodimethylamine	0.66	ND
Bis(2-chloroisopropyl)ether	0.66	ND
N-Nitrosodi-n-propyl amine	0.66	ND
Hexachlorobutadiene	0.66	ND
1,2,4-Trichlorobenzene	0.66	ND
Nitrobenzene	0.66	ND
Isophorone	0.66	ND
Naphthalene	0.66	ND
Bis(2-chloroethoxy)methane	0.66	ND
2-Chloronaphthalene	0.66	ND
Hexachlorocyclopentadiene	0.66	ND
Acenaphthylene	0.66	ND
Acenaphthene	0.66	ND
Dimethyl phthalate	0.66	ND
2,6-Dinitrotoluene	0.66	ND
Fluorene	0.66	ND
2,4-Dinitrotoluene	0.66	ND
Diethyl phthalate	0.66	ND
N-Nitrosodiphenylamine	0.66	ND
Hexachlorobenzene	0.66	ND

Priority Pollutant Analysis
Base Neutrals - SW 8270
Matrix: Soil
(continued)

Date Received: May 24, 1988
Date Reported: May 27, 1988

Work Order: 660
Job No. : NC065

FOR: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88050999
Sample No.:	PNA-Soil
Date Sampled:	5-24-88
Time Sampled:	14:46
Date Extracted:	5-24-18
Date Analyzed:	5-25-88

Compound	Detection Limit mg/kg	ANALYTICAL RESULTS mg/kg
Phenanthrene	0.66	ND
Anthracene	0.66	ND
Dibutyl phthalate	0.66	ND
Fluoranthene	0.66	ND
4-Chlorophenyl phenyl ether	0.66	ND
Pyrene	0.66	1.2
Butyl Benzyl phthalate	0.66	ND
Bis(2-ethylhexyl) phthalate	0.66	ND
Chrysene	0.66	ND
4-Bromophenyl phenyl ether	0.66	ND
Benzo(a)anthracene	0.66	ND
Di-n-octylphthalate	0.66	ND
Benzo(b)fluoranthene	0.66	ND
Benzo(k)fluoranthene	0.66	ND
Benzidine	6.0	ND
3,3'-Dichlorobenzidine	1.3	ND
Benzo(a)pyrene	0.66	ND
Indeno(1,2,3-cd)pyrene	0.66	ND
Dibenzo(a,h)anthracene	0.66	ND
Benzo(ghi)perylene	0.66	ND
Benzyl Alcohol	1.3	ND

Laura Kuck
Analyst

for Ron Buxton
Laboratory Supervisor

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to the client or disposed of at client expense.

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	D B. McCullar	NC065

PROJECT NAME / LOCATION: Wareham Peterson

SAMPLER(S): (SIGNATURE) [signature] Haile

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: Metals	8015	602	608	PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
BT-A1	5/20		H2C	Baker Tank A Top	5	✓	✓	(2)	✓			Composite A1, A2, A3
BT-A2	5/20		"	" A middle	4		✓	(2)	✓			
BT-A3	5/20		"	" A Bottom	4	✓	✓	(1)	✓			
BT-B1	5/20		"	" B Top	5	✓	✓	(2)	✓			Composite B1, B2, B3
BT-B2	5/20		"	" B Middle	4	✓	✓	(1)	✓			
BT-B3	5/20		"	" B Bottom	4	✓	✓	(1)	✓			

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
[signature] Haile	5/20/88 5P.				[signature]

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				Curtis and Tompkins

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Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LAB NUMBER: 14744
CLIENT: ENGINEERING-SCIENCE
Job #: NC065, WAREHAM PETERSON

DATE RECEIVED: 05/23/88
DATE ANALYZED: 05/26/88
DATE REPORTED: 06/06/88

Results of Analysis for Petroleum Hydrocarbons in Water

Method References: TPH: Total Petroleum Hydrocarbons, EPA 3510/8015

LAB ID	COMPOSITE ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
14744-1,2,3	BT-A1,A2,A3	ND(0.05)	ND(0.05)	ND(0.05)	TRACE*
14744-4,5,6	BT-B1,B2,B3	ND(0.05)	ND(0.05)	ND(0.05)	1.1**

*CONTAINS UNIDENTIFIABLE OIL NOT QUANTIFIABLE BY GC.

** FINGERPRINT PATTERN DOES NOT MATCH HYDROCARBON STDS. QUANITATION IS BASED ON AREA SUM OF LARGEST PEAKS WITHIN BOILING RANGE OF HYDROCARBON STDS, C7-C9 AND C11-C22.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

Duplicate: Relative % Difference	13
Spike: % Recovery	94

Jon Wong for CBG
LABORATORY DIRECTOR

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LABORATORY NUMBER: 14744-1,2,3
CLIENT: ENGINEERING-SCIENCE
JOB #: NC065, WAREHAM PETERSON
COMPOSITE ID: BT-A1,A2,A3

DATE RECEIVED: 05/23/88
DATE ANALYZED: 05/26/88
DATE REPORTED: 06/06/88

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	1
Toluene	ND	5
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QC SUMMARY

%RPD	8
%RECOVERY	106

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LABORATORY NUMBER: 14744-4,5,6
CLIENT: ENGINEERING-SCIENCE
JOB #: NC065, WAREHAM PETERSON
COMPOSITE ID: BT-B1,BA2,B3

DATE RECEIVED: 05/23/88
DATE ANALYZED: 05/26/88
DATE REPORTED: 06/06/88

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	1
Toluene	ND	5
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QC SUMMARY

%RPD	8
%RECOVERY	106

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LABORATORY NUMBER: 14735-1,2,3
CLIENT: ENGINEERING-SCIENCE
JOB #: NC065, WAREHAM PETERSON
COMPOSITE ID: BT-A1,A2,A3

DATE RECEIVED: 05/23/88
DATE EXTRACTED: 06/03/88
DATE ANALYZED: 06/03/88
DATE REPORTED: 06/06/88

EPA 608: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3510

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
alpha-BHC	ND	0.05
beta-BHC	ND	0.05
gamma-BHC	ND	0.05
delta-BHC	ND	0.05
Heptachlor	ND	0.05
Aldrin	ND	0.05
Heptachlor Epoxide	ND	0.05
Endosulfan I	ND	0.05
Dieldrin	ND	0.05
pp-DDE	ND	0.05
Endrin	ND	0.05
Endosulfan II	ND	0.05
pp-DDT	ND	0.05
Chlordane	ND	0.5
Toxaphene	ND	0.5
Methoxychlor	ND	0.5
PCB 1016	ND	0.5
PCB 1221	ND	0.5
PCB 1232	ND	0.5
PCB 1242	ND	0.5
PCB 1248	ND	0.5
PCB 1254	ND	0.5
PCB 1260	ND	0.5

ND = Not detected.

QA/QC SUMMARY:

Duplicate: Relative % Difference	22
Average Spike Recovery %	110

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LABORATORY NUMBER: 14735-4,5,6
CLIENT: ENGINEERING-SCIENCE
JOB #: NC065, WAREHAM PETERSON
COMPOSITE ID: BT-B1,B2,B3

DATE RECEIVED: 05/23/88
DATE EXTRACTED: 06/03/88
DATE ANALYZED: 06/03/88
DATE REPORTED: 06/06/88

EPA 608: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3510

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
alpha-BHC	ND	0.05
beta-BHC	ND	0.05
gamma-BHC	ND	0.05
delta-BHC	ND	0.05
Heptachlor	ND	0.05
Aldrin	ND	0.05
Heptachlor Epoxide	ND	0.05
Endosulfan I	ND	0.05
Dieldrin	ND	0.05
pp-DDE	ND	0.05
Endrin	ND	0.05
Endosulfan II	ND	0.05
pp-DDT	ND	0.05
Chlordane	ND	0.5
Toxaphene	ND	0.5
Methoxychlor	ND	0.5
PCB 1016	ND	0.5
PCB 1221	ND	0.5
PCB 1232	ND	0.5
PCB 1242	ND	0.5
PCB 1248	ND	0.5
PCB 1254	ND	0.5
PCB 1260	ND	0.5

ND = Not detected.

QA/QC SUMMARY:

Duplicate: Relative % Difference	22
Average Spike Recovery %	110

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LABORATORY NUMBER: 14744-1,2,3
CLIENT: ENGINEERING-SCIENCE
JOB #: NC065, WAREHAM PETERSON
COMPOSITE ID: BT-A1,A2,A3

DATE RECEIVED: 05/23/88
DATE ANALYZED: 05/24-28/88
DATE REPORTED: 06/06/88

13 Priority Pollutant Metals in Aqueous Solutions

METAL	RESULT mg/L	DETECTION LIMIT mg/L	METHOD
Antimony	ND	0.2	EPA 7040
Arsenic	ND	0.1	EPA 6010
Beryllium	ND	0.02	EPA 7090
Cadmium	ND	0.01	EPA 6010
Chromium (total)	ND	0.02	EPA 6010
Copper	ND	0.02	EPA 6010
Lead	ND	0.2	EPA 6010
Mercury	ND	0.001	EPA 7470
Nickel	0.10	0.05	EPA 6010
Selenium	ND	0.2	EPA 6010
Silver	ND	0.05	EPA 6010
Thallium	ND	0.2	EPA 7840
Zinc	0.05	0.02	EPA 6010

ND = None Detected

QA/QC SUMMARY

	%RPD	%SPIKE		%RPD	%SPIKE
Antimony	<1	88	Mercury	<1	87
Arsenic	<1	111	Nickel	<1	102
Beryllium	<1	106	Selenium	9	122
Cadmium	<1	102	Silver	<1	105
Chromium	<1	100	Thallium	<1	95
Copper	<1	101	Zinc	<1	104
Lead	<1	101			

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LABORATORY NUMBER: 14744-4,5,6
CLIENT: ENGINEERING-SCIENCE
JOB #: NC065, WAREHAM PETERSON
COMPOSITE ID: BT-B1,B2,B3

DATE RECEIVED: 05/23/88
DATE ANALYZED: 05/24-28/88
DATE REPORTED: 06/06/88

13 Priority Pollutant Metals in Aqueous Solutions

METAL	RESULT mg/L	DETECTION LIMIT mg/L	METHOD
Antimony	ND	0.2	EPA 7040
Arsenic	ND	0.1	EPA 6010
Beryllium	ND	0.02	EPA 7090
Cadmium	ND	0.01	EPA 6010
Chromium (total)	ND	0.02	EPA 6010
Copper	ND	0.02	EPA 6010
Lead	ND	0.2	EPA 6010
Mercury	ND	0.001	EPA 7470
Nickel	0.06	0.05	EPA 6010
Selenium	0.2	0.2	EPA 6010
Silver	ND	0.05	EPA 6010
Thallium	ND	0.2	EPA 7840
Zinc	ND	0.02	EPA 6010

ND = None Detected

QA/QC SUMMARY

	%RPD	%SPIKE		%RPD	%SPIKE
Antimony	<1	88	Mercury	<1	87
Arsenic	<1	111	Nickel	<1	102
Beryllium	<1	106	Selenium	9	122
Cadmium	<1	102	Silver	<1	105
Chromium	<1	100	Thallium	<1	95
Copper	<1	101	Zinc	<1	104
Lead	<1	101			

ENGINEERING - SCIENCE, INC.

CHAIN OF CUSTODY RECORD 654

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065

PROJECT NAME / LOCATION: Peterson

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: GC-FID (TPH)	PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
PP-10	May20	3:00	Soil	Main Pit	1	✓	NO		24 hrs turnaround
PP-11	"	3:04	"		1	✓	NO		Period.
PP-12	"	3:12	"		1	✓	NO		

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	May20 3:20				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Friedman	5/20/88 15:26	rec'd intact

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ES
ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01
Client: ES Berkeley
Attention: Dan McCullar
Copy: Rick Makdisi
Project: Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 5-20-88.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88050979	GCFID	5-20-88	3:00	5-20-88	5-21-88	
88050980	GCFID	5-20-88	3:04	5-20-88	5-21-88	
88050981	GCFID	5-20-88	3:12	5-20-88	5-21-88	

* If applicable

Detection Limits
FID Scan
Samples No.: 88050979 - 88050981

Compound	Detection
Petroleum Hydrocarbons	
#2 Diesel	10,000 ug/Kg
Gasoline	10,000 ug/Kg

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ANALYSIS REPORT

WORK ORDER NUMBER: 654
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 05/20/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 4, UNITS: ug/KG, GROUP GCFID

	PP-10	PP-11	PP-12
	5-20-88 3:00	5-20-88 3:04	5-20-88 3:12
TEST COMPOUND	88050979	88050980	88050981
#2 DIESEL	ND	83,000	92,000
GASOLINE	ND	ND	ND

ND - Not Detected

ENGINEERING - SCIENCE, INC.

CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT: ENGINEERING-SCIENCE, INC. BERKELEY	PROJECT MANAGER: Dan McCullar	PROJ. NO.: NC065
PROJECT NAME / LOCATION: Wareham Peterson		
SAMPLER(S): (SIGNATURE) Ajay Singh		

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: TPH (GC-FID)	PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
PP-1	May 17	3:40	Soil	Excavation near	1	✓			24 hrs Rush
PP-2		3:35	"	UST 2 & UST 3	1	✓			
PP-3		3:37	"		1	✓			Mean Lt.
PP-4		3:30	"		1	✓			
PP-5		3:28	"		1	✓			
PP-6		3:20	"		1	✓			
PP-7		3:32	"		1	✓			
PP-8		3:32	"		1	✓			
PP-9		3:25	"		1	✓			
					9				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	May 17 4:30				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Friedman	5-17-84 16:30	rec'd intact

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ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01

Client: ES Berkeley

Attention: Dan McCullar

Copy: Rick Makdisi

Project: Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 5-17-88.

Sample Preparation Data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88050947	GCFID	5-17-88	3:40	5-17-88	5-18-88	
88050948	GCFID	5-17-88	3:35	5-17-88	5-18-88	
88050949	GCFID	5-17-88	3:37	5-17-88	5-18-88	
88050950	GCFID	5-17-88	3:30	5-17-88	5-18-88	
88050951	GCFID	5-17-88	3:28	5-17-88	5-18-88	
88050952	GCFID	5-17-88	3:20	5-17-88	5-18-88	
88050953	GCFID	5-17-88	3:32	5-17-88	5-18-88	
88050954	GCFID	5-17-88	3:32	5-17-88	5-18-88	
88050955	GCFID	5-17-88	3:25	5-17-88	5-18-88	

* If applicable

DETECTION LIMITS
FID SCAN
SAMPLES NO.: 88050947-88050955

Compound	Detection Limits
Petroleum Hydrocarbons	
Diesel #2	10 mg/KG
Unleaded	10 mg/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

CASE NARRATIVE
Sample Nos.: 88050947 - 88050955

Results reported are for gasoline content. The following results were found for Diesel:

Sample No.	Sample ID	Diesel mg/Kg
88050947	PP-1	300
88050948	PP-2	ND
88050949	PP-3	200
88050950	PP-4	91
88050951	PP-5	48
88050952	PP-6	2000
88050953	PP-7	ND
88050954	PP-8	200
88050955	PP-9	78

ANALYSIS REPORT

WORK ORDER NUMBER: 647
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 05/17/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

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CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 4, UNITS: mg/KG, GROUP GCFID

TEST COMPOUND	PP-1 5-17-88 3:40 88050947	PP-2 5-17-88 3:35 88050948	PP-3 5-17-88 3:37 88050949	PP-4 5-17-88 3:30 88050950	PP-5 5-17-88 3:28 88050951	PP-6 5-17-88 3:20 88050952
GC PETROLEUM HYDROCARBONS	1600	ND	200	91	48	2000

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 647

TASK: 4, UNITS: mg/KG, GROUP GCFID

TEST COMPOUND	PP-7 5-17-88 3:32 88050953	PP-8 5-17-88 3:32 88050954	PP-9 5-17-88 3:25 88050955
GC PETROLEUM HYDROCARBONS	ND	200	78

ND - Not Detected

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065.

PROJECT NAME / LOCATION: WAREHAM PETERSON

SAMPLER(S): (SIGNATURE) Ajay Singh

ANALYSES REQUIRED

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	MOD 8015	624	608 (PCB'S)	625	Drinking water Inorganics scan (TDS, pH etc)	PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME	REMARKS
WW1-90	May 11, 88		Water	Peterson Well Depth 90'	4	✓	✓	✓	✓	✓			2 Wks.	
WW1-300	"		Water	" " " 300'	6	✓	✓	✓	✓	✓				
WW1-150	"		Water	" " " 150'	6	✓	✓	✓	✓	✓				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	May 11, 88 5:00	[illegible]	[illegible]	5/11/88 1804	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		[illegible] BBC	5/11/88 1804	Brown and Caldwell

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BROWN AND CALDWELL
EMERYVILLE, CALIFORNIA

LABORATORY
ORDER

PAGE

ORDER DATE 12 MAY 88
PRINT DATE 16 MAY 88 02:31PM

ORDER NO E88-05-340

DUE: 25 MAY

REPORT TO: Engineering Science
600 Bancroft Way
Berkeley, California 94710
ATTN: Mr. Dan McCullar

LABORATORY ORDER
ACKNOWLEDGEMENT
CUSTOMER COPY

INVOICE: Engineering Science
600 Bancroft Way
Berkeley, California 94710
ATTN: Mr. Dan McCullar

PROJECT: NC065

SAMPLED BY: CLIENT DELIVERED BY: CLIENT DISPOSE AFTER 11 JUN

ITEM	LOG NUMBER	DESCRIPTION OF SAMPLE	SAMPLED DATE/TIME	RECEIVED	TYPE
1	05-340-1	WW1-90	11 MAY	11 MAY	GW

DETERMINATION	CODE	DEPT	QTY	PRICE	AMOUNT
Polychlorinated Biphenyls	PCB	GC	1	775.00	775.00
Total Fuel Hydrocarbons	FUEL.HC	GC			
B/N,A Ext.Pri.Poll. (EPA-625)	625	MS			
Purgeable Priority Pollutants	624	MS			

LABORATORY ORDER CONTINUED ON PAGE 2

BROWN AND CALDWELL
EMERYVILLE, CALIFORNIA

LABORATORY ORDER

ORDER DATE 12 MAY 88
PRINT DATE 16 MAY 88 02:31PM

ORDER NO E88-05-340

REPORT TO: Engineering Science
600 Bancroft Way
Berkeley, California 94710
ATTN: Mr. Dan McCullar

DUE: 25 MAY

INVOICE: Engineering Science
600 Bancroft Way
Berkeley, California 94710
ATTN: Mr. Dan McCullar

PROJECT: NC065

SAMPLED BY: CLIENT DELIVERED BY: CLIENT DISPOSE AFTER 11 JUN

ITEM	LOG NUMBER	DESCRIPTION OF SAMPLE	SAMPLED DATE/TIME	RECEIVED	TYPE
2	05-340-2	WW1-300	11 MAY		GW
	05-340-3	WW1-150	11 MAY		

DETERMINATION	CODE	DEPT	QTY	PRICE	AMOUNT
Alkalinity	ALK	GE	2	925.00	1850.00
Calcium (EDTA Titration)	CA,EDTA	GE			
Magnesium	MG	ME			
Chloride	CL	GE			
Copper	CU	ME			
Surfactants	MBAS	GE			
Iron	FE	ME			
Manganese	MN				
pH	PH	GE			
Potassium	K	ME			
Sodium	NA				
Sulfate	SO4	GE			
Specific Conductance	COND				
Filterable Residue (TDS)	TDS				
Zinc	ZN	ME			
Nitrate (as NO3)	NO3	GE			
Nitric Acid Digestion	DIG,AQ	ME			
General Mineral Approval	GM.APPR	GE			
Polychlorinated Biphenyls	PCB	GC			
Total Fuel Hydrocarbons	FUEL.HC	GC			
B/N,A Ext.Pri.Poll. (EPA-625)	625	MS			
Purgeable Priority Pollutants	624	MS			

ITEM NOTES: VERY LIMITED SAMPLE FOR ALL GENERAL MINERAL TESTS

ORDER NOTE:

INVOICE TO READ:

TOTAL AMOUNT DUE $2,625.00
INVOICE: WITH REPORT

BROWN AND CALDWELL LABORATORIES

1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-05-340

Received: 11 MAY 88
Reported: 09 JUN 88

Mr. Dan McCullar
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-1	WW1-90	11 MAY 88

PARAMETER	05-340-1
Polychlorinated Biphenyls	
Date Extracted	05.17.88
Date Analyzed	05.18.88
Aroclor 1016, ug/L	<0.3
Aroclor 1221, ug/L	<0.3
Aroclor 1232, ug/L	<0.3
Aroclor 1242, ug/L	<0.3
Aroclor 1248, ug/L	<0.3
Aroclor 1254, ug/L	2.4
Aroclor 1260, ug/L	<0.3
Aroclor 1262, ug/L	<0.3
Total PCB's, ug/L	2.4
Total Fuel Hydrocarbons, mg/L	40

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

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Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-1	WW1-90	11 MAY 88

PARAMETER	05-340-1
B/N,A Ext.Pri.Poll. (EPA-625)	
Extraction	05.27.88
Date Analyzed	06.06.88
Dilution Factor, Times 1	2
1,2,4-Trichlorobenzene, ug/L	<2
1,2-Dichlorobenzene, ug/L	<2
1,2-Diphenylhydrazine, ug/L	<2
1,3-Dichlorobenzene, ug/L	<2
1,4-Dichlorobenzene, ug/L	<2
2,4,6-Trichlorophenol, ug/L	<2
2,4-Dichlorophenol, ug/L	<2
2,4-Dimethylphenol, ug/L	<2
2,4-Dinitrotoluene, ug/L	<2
2,4-Dinitrophenol, ug/L	<20
2,6-Dinitrotoluene, ug/L	<2
2-Chloronaphthalene, ug/L	<2
2-Nitrophenol, ug/L	<2
2-Chlorophenol, ug/L	<2
2-Methyl-4,6-dinitrophenol, ug/L	<2
3,3'-Dichlorobenzidine, ug/L	<2
4-Bromophenylphenylether, ug/L	<2
4-Chloro-3-methylphenol, ug/L	<2
4-Chlorophenylphenylether, ug/L	<2
4-Nitrophenol, ug/L	<40
Acenaphthene, ug/L	24
Acenaphthylene, ug/L	<2
Anthracene, ug/L	32

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

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Received: 11 MAY 88
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Mr. Dan McCullar
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-1	WW1-90	11 MAY 88

PARAMETER	05-340-1
Bis(2-ethylhexyl)phthalate, ug/L	<200
Benzidine, ug/L	<80
Bis(2-chloroethyl)ether, ug/L	<2
Bis(2-chloroisopropyl)ether, ug/L	<2
Bis(2-chloroethoxy)methane, ug/L	<2
Benzo(a)anthracene, ug/L	54
Benzo(a)pyrene, ug/L	18
Benzo(b)fluoranthene, ug/L	28
Benzo(g,h,i)perylene, ug/L	8
Benzo(k)fluoranthene, ug/L	30
Butylbenzylphthalate, ug/L	<2
Chrysene, ug/L	40
Di-n-octylphthalate, ug/L	<2
Dibenzo(a,h)anthracene, ug/L	4
Dibutylphthalate, ug/L	<2
Diethylphthalate, ug/L	<2
Dimethylphthalate, ug/L	<2
Fluorene, ug/L	30
Fluoranthene, ug/L	70
Hexachlorobenzene, ug/L	<2
Hexachlorobutadiene, ug/L	<2
Hexachlorocyclopentadiene, ug/L	<2
Hexachloroethane, ug/L	<2
Indeno(1,2,3-c,d)pyrene, ug/L	8
Isophorone, ug/L	<2
N-Nitrosodi-n-propylamine, ug/L	<2
N-Nitrosodimethylamine, ug/L	<2

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Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-1	WW1-90	11 MAY 88

PARAMETER	05-340-1
N-Nitrosodiphenylamine, ug/L	<2
Naphthalene, ug/L	<2
Nitrobenzene, ug/L	<2
Pentachlorophenol, ug/L	<2
Phenanthrene, ug/L	110
Phenol, ug/L	<2
Pyrene, ug/L	130
Other B/N,A Ext.Pri.Poll. (EPA-625)	---
Semi-Quantified Results **	
C9-C30 Hydrocarbons, ug/L	50000

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

BROWN AND CALDWELL LABORATORIES
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Mr. Dan McCullar
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-1	WW1-90	11 MAY 88

PARAMETER	05-340-1
Purgeable Priority Pollutants	
Date Extracted	05.23.88
1,1,1-Trichloroethane, ug/L	<10
1,1,2,2-Tetrachloroethane, ug/L	<10
1,1,2-Trichloroethane, ug/L	<10
1,1-Dichloroethane, ug/L	<10
1,1-Dichloroethylene, ug/L	<10
1,2-Dichloroethane, ug/L	<10
1,2-Dichloropropane, ug/L	<10
1,3-Dichloropropene, ug/L	<10
2-Chloroethylvinylether, ug/L	<10
Acrolein, ug/L	<100
Acrylonitrile, ug/L	<100
Bromodichloromethane, ug/L	<10
Bromomethane, ug/L	<10
Benzene, ug/L	<10
Chlorobenzene, ug/L	<10
Carbon Tetrachloride, ug/L	<10
Chloroethane, ug/L	<10
Bromoform, ug/L	<10
Chloroform, ug/L	<10
Chloromethane, ug/L	<10
Dibromochloromethane, ug/L	<10
Ethylbenzene, ug/L	<10
Methylene chloride, ug/L	<10
Tetrachloroethylene, ug/L	<10
Trichloroethylene, ug/L	<10

BROWN AND CALDWELL LABORATORIES

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600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-1	WW1-90	11 MAY 88

PARAMETER	05-340-1
Trichlorofluoromethane, ug/L	<10
Toluene, ug/L	13
Vinyl chloride, ug/L	<10
trans-1,2-Dichloroethylene, ug/L	<10
trans-1,3-Dichloropropene, ug/L	<10
Semi-Quantified Results **	
4-Methyl-2-Pentanone, ug/L	600
C6-C11 Hydrocarbons, ug/L	5000

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

BROWN AND CALDWELL LABORATORIES
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Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-2	WW1-300	11 MAY 88
05-340-3	WW1-150	11 MAY 88

PARAMETER	05-340-2	05-340-3
Polychlorinated Biphenyls		
Date Extracted	05.17.88	05.17.88
Date Analyzed	05.18.88	05.18.88
Aroclor 1016, ug/L	<0.3	<0.3
Aroclor 1221, ug/L	<0.3	<0.3
Aroclor 1232, ug/L	<0.3	<0.3
Aroclor 1242, ug/L	<0.3	<0.3
Aroclor 1248, ug/L	<0.3	<0.3
Aroclor 1254, ug/L	<0.3	<0.3
Aroclor 1260, ug/L	<0.3	<0.3
Aroclor 1262, ug/L	<0.3	<0.3
Other Polychlorinated Biphenyls	---	---
Total Fuel Hydrocarbons, mg/L	<1.0	3.3

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ANALYTICAL REPORT

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Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-2	WW1-300	11 MAY 88
05-340-3	WW1-150	11 MAY 88

PARAMETER	05-340-2	05-340-3
B/N,A Ext.Pri.Poll. (EPA-625)		
Extraction	05.27.88	05.27.88
Date Analyzed	06.06.88	06.06.88
Dilution Factor, Times 1	2	2
1,2,4-Trichlorobenzene, ug/L	<2	<2
1,2-Dichlorobenzene, ug/L	<2	<2
1,2-Diphenylhydrazine, ug/L	<2	<2
1,3-Dichlorobenzene, ug/L	<2	<2
1,4-Dichlorobenzene, ug/L	<2	<2
2,4,6-Trichlorophenol, ug/L	<2	<2
2,4-Dichlorophenol, ug/L	<2	<2
2,4-Dimethylphenol, ug/L	<2	<2
2,4-Dinitrotoluene, ug/L	<2	<2
2,4-Dinitrophenol, ug/L	<20	<20
2,6-Dinitrotoluene, ug/L	<2	<2
2-Chloronaphthalene, ug/L	<2	<2
2-Nitrophenol, ug/L	<2	<2
2-Chlorophenol, ug/L	<2	<2
2-Methyl-4,6-dinitrophenol, ug/L	<2	<2
3,3'-Dichlorobenzidine, ug/L	<2	<2
4-Bromophenylphenylether, ug/L	<2	<2
4-Chloro-3-methylphenol, ug/L	<2	<2
4-Chlorophenylphenylether, ug/L	<2	<2
4-Nitrophenol, ug/L	<40	<40
Acenaphthene, ug/L	<2	4
Acenaphthylene, ug/L	<2	<2

BROWN AND CALDWELL LABORATORIES

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Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-2	WW1-300	11 MAY 88
05-340-3	WW1-150	11 MAY 88

PARAMETER	05-340-2	05-340-3
Anthracene, ug/L	<2	5
Bis(2-ethylhexyl)phthalate, ug/L	<200	<200
Benzidine, ug/L	<80	<80
Bis(2-chloroethyl)ether, ug/L	<2	<2
Bis(2-chloroisopropyl)ether, ug/L	<2	<2
Bis(2-chloroethoxy)methane, ug/L	<2	<2
Benzo(a)anthracene, ug/L	4	5
Benzo(a)pyrene, ug/L	<2	<2
Benzo(b)fluoranthene, ug/L	2	4
Benzo(g,h,i)perylene, ug/L	<2	<2
Benzo(k)fluoranthene, ug/L	2	4
Butylbenzylphthalate, ug/L	<2	<2
Chrysene, ug/L	4	6
Di-n-octylphthalate, ug/L	<2	<2
Dibenzo(a,h)anthracene, ug/L	<2	<2
Dibutylphthalate, ug/L	<2	<2
Diethylphthalate, ug/L	<2	<2
Dimethylphthalate, ug/L	<2	<2
Fluorene, ug/L	<2	4
Fluoranthene, ug/L	18	32
Hexachlorobenzene, ug/L	<2	<2
Hexachlorobutadiene, ug/L	<2	<2
Hexachlorocyclopentadiene, ug/L	<2	<2
Hexachloroethane, ug/L	<2	<2
Indeno(1,2,3-c,d)pyrene, ug/L	<2	<2
Isophorone, ug/L	<2	<2

BROWN AND CALDWELL LABORATORIES
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Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-2	WW1-300	11 MAY 88
05-340-3	WW1-150	11 MAY 88

PARAMETER	05-340-2	05-340-3
N-Nitrosodi-n-propylamine, ug/L	<2	<2
N-Nitrosodimethylamine, ug/L	<2	<2
N-Nitrosodiphenylamine, ug/L	<2	<2
Naphthalene, ug/L	<2	<2
Nitrobenzene, ug/L	<2	<2
Pentachlorophenol, ug/L	<2	<2
Phenanthrene, ug/L	<2	19
Phenol, ug/L	<2	<2
Pyrene, ug/L	16	26
Other B/N,A Ext.Pri.Poll. (EPA-625)	---	---
Semi-Quantified Results **		
C9-C30 Hydrocarbons, ug/L	7000	20000

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

BROWN AND CALDWELL LABORATORIES

1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

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Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-2	WW1-300	11 MAY 88
05-340-3	WW1-150	11 MAY 88

PARAMETER	05-340-2	05-340-3
Purgeable Priority Pollutants		
Date Extracted	05.20.88	05.20.88
1,1,1-Trichloroethane, ug/L	<10	<10
1,1,2,2-Tetrachloroethane, ug/L	<10	<10
1,1,2-Trichloroethane, ug/L	<10	<10
1,1-Dichloroethane, ug/L	<10	<10
1,1-Dichloroethylene, ug/L	<10	<10
1,2-Dichloroethane, ug/L	<10	<10
1,2-Dichloropropane, ug/L	<10	<10
1,3-Dichloropropene, ug/L	<10	<10
2-Chloroethylvinylether, ug/L	<10	<10
Acrolein, ug/L	<100	<100
Acrylonitrile, ug/L	<100	<100
Bromodichloromethane, ug/L	<10	<10
Bromomethane, ug/L	<10	<10
Benzene, ug/L	<10	<10
Chlorobenzene, ug/L	<10	<10
Carbon Tetrachloride, ug/L	<10	<10
Chloroethane, ug/L	<10	<10
Bromoform, ug/L	<10	<10
Chloroform, ug/L	<10	<10
Chloromethane, ug/L	<10	<10
Dibromochloromethane, ug/L	<10	<10
Ethylbenzene, ug/L	<10	<10
Methylene chloride, ug/L	<10	<10
Tetrachloroethylene, ug/L	<10	<10

BROWN AND CALDWELL LABORATORIES

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Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
05-340-2	WW1-300	11 MAY 88
05-340-3	WW1-150	11 MAY 88

PARAMETER	05-340-2	05-340-3
Trichloroethylene, ug/L	<10	<10
Trichlorofluoromethane, ug/L	<10	<10
Toluene, ug/L	<10	<10
Vinyl chloride, ug/L	<10	<10
trans-1,2-Dichloroethylene, ug/L	<10	<10
trans-1,3-Dichloropropene, ug/L	<10	<10
Semi-Quantified Results **		
Acetone, ug/L	100	200
C6-C11 Hydrocarbons, ug/L	400	900
Methyl ethyl ketone, ug/L	400	500

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-05-340

Received: 11 MAY 88
Reported: 09 JUN 88

Mr. Dan McCullar
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

Log Number : 88-05-340-2
Sample Description: WW1-300

General Mineral Analysis
Sampled Date 11 MAY 88

Anions	mg/L	meq/L
Nitrate (as N03)	<0.44	<0.0071
Chloride	150	4.2
Sulfate	46	0.96
Bicarbonate (as HC03)	330	5.4
Carbonate (as C03)	<0.6	<0.02
Total Milliequivalents per Liter		10.6

Cations	mg/L	meq/L
Sodium	85	3.7
Potassium	1.6	0.041
Calcium (EDTA Titration)	83	4.1
Magnesium	34	2.8
Total Milliequivalents per Liter		10.6

Determination	mg/L
Hydroxide Alk (as CaC03)	<1
Carbonate Alk (as CaC03)	<1
Bicarbonate Alk (as CaC03	270
Ca Hardness (as CaC03)	210
Mg Hardness (as CaC03)	140
Total Hardness (as CaC03)	350
Iron	12
Manganese	2.9
Copper	0.03
Zinc	0.38
Surfactants	0.04
Filterable Residue (TDS)	640
Sp. Conductance, umhos/cm	1060
pH, units	7.0

* Conforms to Title 22, California Administrative Code

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-05-340

Received: 11 MAY 88
Reported: 09 JUN 88

Mr. Dan McCullar
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

Log Number : 88-05-340-3
Sample Description: WW1-150

General Mineral Analysis
Sampled Date 11 MAY 88

Anions	mg/L	meq/L
Nitrate (as NO3)	1.7	0.027
Chloride	140	3.9
Sulfate	47	0.98
Bicarbonate (as HCO3)	160	2.6
Carbonate (as CO3)	<0.6	<0.02
Total Milliequivalents per Liter		7.5

Cations	mg/L	meq/L
Sodium	77	3.3
Potassium	1.8	0.046
Calcium (EDTA Titration)	78	3.9
Magnesium	31	2.6
Total Milliequivalents per Liter		9.8

Determination	mg/L
Hydroxide Alk (as CaCO3)	<1
Carbonate Alk (as CaCO3)	<1
Bicarbonate Alk (as CaCO3	130
Ca Hardness (as CaCO3)	190
Mg Hardness (as CaCO3)	130
Total Hardness (as CaCO3)	320
Iron	21
Manganese	2.2
Copper	0.07
Zinc	0.17
Surfactants	0.05
Filterable Residue (TDS)	600
Sp. Conductance, umhos/cm	1060
pH, units	7.0

* Conforms to Title 22, California Administrative Code

Sim D. Lessley, Ph.D. / Laboratory Director

ENGINEERING - SCIENCE, INC.

CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065

PROJECT NAME / LOCATION: WAREHAM PETERSON

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	8240	GC-FID	PCB's (8080)			PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
~~Pet-S-01~~ 10 PRGC	May 11 88	2:10	Soil	Composite Soil Sample from all over the Site 100'x 100' grid.	1	✓	✓	✓					24 hr turn

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	May 11, 88 4:15				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Friedman	5-11-88 16:20	E.S. Lab.

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ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: May 11, 1988
Date Reported: May 12, 1988

Work Order : 635
Job No. : NC065

For: ES:Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88050900
Sample No.:	WPRSC
Date Sampled:	5-11-88
Time Sampled:	15:10
Date Analyzed:	5-12-88

Compound	Detection Limit ug/kg	Analytical Results ug/kg
Chloromethane	10	ND
Bromomethane	10	ND
Vinyl Chloride	10	ND
Chloroethane	10	ND
Dichloromethane	5	ND
Trichlorofluoromethane	10	ND
1,1-Dichloroethene	5	ND
1,1-Dichloroethane	5	ND
trans-1,2-Dichloroethene	5	ND
Chloroform	5	ND
1,2-Dichloroethane	5	ND
1,1,1-Trichloroethane	5	ND
Carbon Tetrachloride	5	ND
Bromodichloromethane	5	ND
1,2-Dichloropropane	5	ND
trans-1,3-Dichloropropene	5	ND
Trichloroethene	5	ND
Benzene	5	ND
Dibromochloromethane	5	ND
1,1,2-Trichloroethane	5	ND
cis-1,3-Dichloropropene	5	ND
2-Chloroethyl vinyl ether	10	ND
Bromoform	5	ND
1,1,2,2-Tetrachloroethane	5	ND
Tetrachloroethene	5	ND
Toluene	5	ND
Chlorobenzene	5	ND
Ethylbenzene	5	ND
Styrene	5	ND
Total Xylenes	5	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: May 11, 1988
Date Reported: May 12, 1988

Work Order : 635
Job No.: NC065

For: ES:Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88050900
Sample No.:	WPRSC
Date Sampled:	5-11-88
Time Sampled:	15:10
Date Analyzed:	5-12-88

Compound	Detection Limits ug/kg	Analytical Results ug/kg
Acetone	100	ND
Acrolein	10	ND
Acrylonitrile	10	ND
2-Butanone (MEK)	100	ND
Carbon Disulfide	10	ND
Dibromomethane	10	ND
1,4-Dichloro-2-butene	10	ND
Dichlorodifluoromethane	10	ND
Ethyl methacrylate	10	ND
2-Hexanone	50	ND
Iodomethane	10	ND
4-Methyl-2-pentanone	50	ND
1,2,3-Trichloropropane	10	ND
Vinyl acetate	50	ND

Laura Kuck
Analyst

Laboratory Supervisor

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ES
ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01

Client: ES Berkeley

Attention: Dan McCullar

Copy: Rick Makdisi

Project: Peterson Manufacturing

Attached are the analytical reports for the soil sample received by this laboratory on 5-11-88.

Sample Preparation Data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88050900	GCFID	5-11-88	3:10	5-11-88	5-12-88	
88050900	PCB	5-11-88	3:10	5-12-88	5-12-88	

* If applicable

DETECTION LIMITS
ENVIRONMENTAL QUALITY PARAMETERS
SAMPLE NO.: 88050900

Parameter	Units	Detection Limits
Petroleum Hydrocarbons		
#2 Diesel	ug/KG	10,000
Unleaded gasoline	ug/KG	10,000

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

DETECTION LIMITS
PCB'S
EPA 608/8080
SAMPLE NO.: 88050900

Compound	Detection Limits
PCB-1016	670 ug/KG
PCB-1221	2700 ug/KG
PCB-1232	2000 ug/KG
PCB-1242	1300 ug/KG
PCB-1248	1300 ug/KG
PCB-1254	13 ug/KG
PCB-1260	3 ug/KG

Matrix interferences in the sample caused the detection limits to be increased by a factor of 100.

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ANALYSIS REPORT

WORK ORDER NUMBER: 635
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 05/11/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 4, UNITS: ug/KG, GROUP GCFID

TEST COMPOUND	WPRS-C 5-11-88 3:10 88050900
GC PETROLEUM HYDROCARBONS	20,000

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 635

TASK: 4, UNITS: ug/KG, GROUP PCB

TEST COMPOUND	WPRS-C 5-11-88 3:10 88050900
PCB-1016	ND
PCB-1221	ND
PCB-1232	ND
PCB-1242	ND
PCB-1248	ND
PCB-1254	ND
PCB-1260	42

ND - Not Detected

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065.

PROJECT NAME / LOCATION: WAREHAM PETERSON

SAMPLER(S): (SIGNATURE) Ajay Leigh.

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: Metal & Cam	PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
WPRS-C	May 11 88	8:10	Soil	Composite Soil Sample from all over the site 100'x100' grid.	1	✓			24 hr Rush.

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	May 11 88 4:45	[signature]			
[signature]	5/11/88 17:30	RECEIVED FOR LABORATORY BY: (SIGNATURE) Janet E. Dalbritz	DATE/TIME 5/11/88 17:30	REMARKS TMA NORCAL	

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TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O Box 4040
Richmond, CA 94804-0040

(415) 235-2633

May 17, 1988

Engineering Science
600 Bancroft Way
Berkeley, CA 94710

Attention: Dan McCullar

Report #: 2226-44

Subject: One soil sample submitted for rush metals analysis on May 11, 1988.
Procedure: The filters are analyzed for fourteen metals by ICP (Inductively Coupled Plasma) atomic emissions spectrophotometry.

The results are shown in table one. If you have any questions, please call.

Submitted by:

Robert Chrin

Robert Chrin
Metals Department Supervisor

Prepared by:

Deborah Fisher

Deborah Fisher
Project Manager

RC:DF:aer

Table 1

Metals Analysis
on soil, as received

TMA/Norcal I.D.: 2226-44
Client I.D.: WPRS-C 051188 3:10

Metals	Results (mg/kg)
Antimony	<4.3
Barium	240
Beryllium	0.35
Cadmium	1.9
Chromium	26
Cobalt	8.7
Copper	39
Lead	100
Molybdenum	<0.35
Nickel	26
Silver	<0.71
Thallium	<5.3
Vanadium	25
Zinc	150

Chain of Custody Form

Curtis & Tompkins, Ltd
290 Division Street
San Francisco, CA 94103
(415) 861-1863

Samplers: AJAY SINGH

Job Description: WARNHAM - PETERSON

Job Number: NC065

Client Contact: DAN B. McCULLAR

Recorder: DB McCULLAR

Matrix: Water	Soil	Waste	Oil			#Containers	Method Preserved: H_2SO_4	HNO_3	Ice	None	Other	Sample Number	Sampling Date: Yr	Mo	Dy	Time	SAMPLE NOTES
	X					1			X			EXNUST-1	88	05	09	1340	24/48 hr RUSH
	X					1			X			EXNBH-1	88	05	09	1400	"

ANALYSIS REQUESTED															
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	CAM 17 Metals	EPA PP Metals (#)	TPH Method-	Benzene-Toluene-Xylene(s)	Oil and Grease	EPA 608/8080 Pest's&PCB's	MODIFIED 8015					
										X					
										X					

Laboratory Notes :

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
5/9/88 5:50	
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received for Lab by (signature) 5/9/88 17:50

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LAB NUMBER: 14674
CLIENT: ENGINEERING-SCIENCE
Job #: NC065, WAREHAM-PETERSON

DATE RECEIVED: 05-10-88
DATE ANALYZED: 05-10-88
DATE REPORTED: 05-11-88

Results of Analysis for Petroleum Hydrocarbons in Soils & Wastes

Method References: TPH: Total Petroleum Hydrocarbons, EPA 3550/8015

LAB ID	CLIENT ID	GASOLINE (mg/kg)	KEROSINE (mg/kg)	DIESEL (mg/kg)	OTHER * (mg/kg)
14674-1	EXNUST-1	ND(10)	ND(10)	ND(10)	*
14674-2	EXNBH-1	ND(10)	ND(10)	ND(10)	ND(10)

* UNIDENTIFIABLE OIL NOT QUANTIFIABLE BY GC.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

Duplicate: Relative % Difference	13
Spike: % Recovery	129

LABORATORY DIRECTOR

ENGINEERING-SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	DAN McCullar	1X0655.

PROJECT NAME / LOCATION:
PETERSON – DISCHARGE IN THE EXCAVATION PIT

SAMPLER(S): (SIGNATURE) Ajay Singh.
AJAY SINGH

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: GC-FID (TPH)	A13.2	PCB's (608)	lead.			PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
PIT-DIS	May 9, 88		GW	DISCHARGE IN THE EXCAVATION	1	✓								48 hr turnaround
〃	〃		〃	〃	1		✓	✓						〃
〃	〃		〃	〃	1			✓						〃
〃	〃		〃	〃	2				✓					Composite. 〃
〃	〃													

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh.	May 9, 88 | 4:45				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Jo Mueller	5/9/88 | 16:45	

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ES

ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01

Client: ES Berkeley

Attention: Dan McCullar

Copy: Rick Makdisi

Project: Peterson Manufacturing

Attached are the analytical reports for the water samples received by this laboratory on 5/9/88.

Sample Preparation Data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88050864	Lead	5/9/88	Not Given		5/10/88	
88050864	413.2	5/9/88	Not Given	5/9/88	5/10/88	
88050864	GCFID	5/9/88	Not Given	5/10/88	5/11/88	
88050864	PCB	5/9/88	Not Given	5/9/88	5/10/88	

* If applicable

DETECTION LIMITS
ENVIRONMENTAL QUALITY PARAMETERS
SAMPLES NO.: 88050864

Parameter	Units	Detection Limits
Lead	mg/L	0.1
413.2 Oil & Grease	mg/L	1

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

DETECTION LIMITS
FID SCAN
SAMPLES NO.: 88050864

Compound	Detection Limits
Petroleum Hydrocarbons	
#2 Diesel	50 ug/L
Unleaded Gasoline	50 ug/L

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

DETECTION LIMITS
PCB'S
EPA 608/8080
SAMPLES NO.: 88050864

Compound	Detection Limits
PCB-1016	0.5 ug/L
PCB-1221	0.5 ug/L
PCB-1232	0.5 ug/L
PCB-1242	0.5 ug/L
PCB-1248	0.5 ug/L
PCB-1254	1.0 ug/L
PCB-1260	1.0 ug/L

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING SCIENCE INC.
05/13/88

ANALYSIS REPORT

WORK ORDER NUMBER: 626
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 05/09/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : MC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 2, UNITS: mg/L

	PIT-DIS 5-9-88
TEST COMPOUND	88050864
3010	NA
PB-A	1.1

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 626

TASK: 3, UNITS: mg/L

TEST COMPOUND	PIT-DIS 5-9-88 88050864
413.2 TOTAL OIL AND GREASE-IR	2.0

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 626

TASK: 4, UNITS: ug/L, GROUP GCFID

	PIT-DIS 5-9-88
TEST COMPOUND	88050864
GC PETROLEUM HYDROCARBONS	2800

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 626

TASK: 4, UNITS: ug/L, GROUP PCB

	PIT-DIS 5-9-88
TEST COMPOUND	88050864
PCB-1016	ND
PCB-1221	ND
PCB-1232	ND
PCB-1242	ND
PCB-1248	ND
PCB-1254	ND
PCB-1260	ND

ND - Not Detected

ENGINEERING – SCIENCE, INC.

CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065.

PROJECT NAME / LOCATION: WAREHAM PETERSON

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: 8240	8270	PCB's	GC-FID Waste Oil	Metals (CAM) 200.7 (Pb only)	PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
PETERSON-ASP	MAY 6, 1988	13:30	Asphalt	Peterson	1	✓	✓	✓	✓	✓			

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	May 6, 88 4 ~~4:45~~				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Friedman	5-6-88 17:00	rec'd cold & intact

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ES
ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01

Client: ES Berkeley

Attention: Dan McCullar

Copy: Rick Makdisi

Project: Peterson Manufacturing

Attached are the analytical reports for the soil sample received by this laboratory on 5-06-88.

Sample Preparation Data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88050845	Lead	5-06-88	3:30		5-26-88	
88050845	GCFID	5-06-88	3:30	5-09-88	5-16-88	
88050845	PCB	5-06-88	3:30	5-09-88	5-16-88	

* If applicable

DETECTION LIMITS
ENVIRONMENTAL QUALITY PARAMETERS
SAMPLE NO.: 88050845

Parameter	Units	Detection Limits
Lead	mg/KG	0.5

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

DETECTION LIMITS
FID SCAN
SAMPLE NO.: 88050845

Compound	Detection Limits
Petroleum Hydrocarbons	300 mg/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

DETECTION LIMITS
PCB'S
EPA 608/8080
SAMPLE NO.: 88050845

Compound	Detection Limits
PCB-1016	25 ug/KG
PCB-1221	100 ug/KG
PCB-1232	75 ug/KG
PCB-1242	50 ug/KG
PCB-1248	50 ug/KG
PCB-1254	50 ug/KG
PCB-1260	50 ug/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ANALYSIS REPORT

WORK ORDER NUMBER: 622
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 05/06/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 2, UNITS: mg/KG

TEST COMPOUND	PETERSON-ASP 5-6-88 3:30 88050845
3050	NA
PB-A	440

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 622

TASK: 4, UNITS: mg/KG, GROUP GCFID

TEST COMPOUND	PETERSON-ASP 5-6-88 3:30 88050845
GC PETROLEUM HYDROCARBONS	43.000

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 622

TASK: 4, UNITS: ug/KG, GROUP PCB

TEST COMPOUND	PETERSON-ASP 5-6-88 3:30 88050845
PCB-1016	ND
PCB-1221	ND
PCB-1232	ND
PCB-1242	ND
PCB-1248	ND
PCB-1254	ND
PCB-1260	ND

ND - Not Detected

ENGINEERING SCIENCE
Priority Pollutant Analysis
Base Neutrals - SW 8270
Matrix: Soil

Date Received: May 6, 1988
Date Reported: May 24, 1988

Work Order: 622
Job No. : NC065

FOR: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88050845
Sample No.:	Peterson Asp
Date Sampled:	5-06-88
Time Sampled:	03:30
Date Extracted:	5-09-88
Date Analyzed:	5-20-88

Compound	Detection Limits mg/kg	ANALYTICAL RESULTS mg/kg
,3-Dichlorobenzene	1.66	ND
,4-Dichlorobenzene	1.66	ND
Hexachloroethane	1.66	ND
is(2-chloroethyl)ether	1.66	ND
,2-Dichlorobenzene	1.66	ND
N-Nitrosodimethylamine	1.66	ND
is(2-chloroisopropyl)ether	1.66	ND
-Nitrosodi-n-propyl amine	1.66	ND
exachlorobutadiene	1.66	ND
1,2,4-Trichlorobenzene	1.66	ND
itrobenzene	1.66	ND
sophorone	1.66	ND
Naphthalene	1.66	ND
is(2-chloroethoxy)methane	1.66	ND
-Chloronaphthalene	1.66	ND
exachlorocyclopentadiene	1.66	ND
Acenaphthylene	1.66	ND
cenaphthene	1.66	ND
imethyl phthalate	1.66	ND
2,6-Dinitrotoluene	1.66	ND
luorene	1.66	6.1
,4-Dinitrotoluene	1.66	ND
Diethyl phthalate	1.66	ND
-Nitrosodiphenylamine	1.66	ND
exachlorobenzene	1.66	ND

Priority Pollutant Analysis
Base Neutrals - SW 8270
Matrix: Soil
(continued)

Date Received: May 6, 1988
Date Reported: May 24, 1988

Work Order: 622
Job No. : NC065

FOR: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88050845
Sample No.:	Peterson Asp
Date Sampled:	5-06-88
Time Sampled:	03:30
Date Extracted:	5-09-88
Date Analyzed:	5-20-88

Compound	Detection Limit mg/kg	ANALYTICAL RESULTS mg/kg
Phenanthrene	1.66	19
Anthracene	1.66	2.5
Dibutyl phthalate	1.66	ND
Fluoranthene	1.66	7.7
4-Chlorophenyl phenyl ether	1.66	ND
Pyrene	1.66	16
Butyl Benzyl phthalate	1.66	ND
Bis(2-ethylhexyl) phthalate	1.66	ND
Chrysene	1.66	23
4-Bromophenyl phenyl ether	1.66	ND
Benzo(a)anthracene	1.66	9.6
Di-n-octylphthalate	1.66	ND
Benzo(b)fluoranthene	1.66	ND
Benzo(k)fluoranthene	1.66	ND
Benzidine	15	ND
3,3'-Dichlorobenzidine	3.25	ND
Benzo(a)pyrene	1.66	ND
Indeno(1,2,3-cd)pyrene	1.66	ND
Dibenzo(a,h)anthracene	1.66	ND
Benzo(ghi)perylene	1.66	ND
Benzyl Alcohol	3.25	ND

Priority Pollutant Analysis
Base Neutrals - SW 8270
Matrix: Soil
(continued)

Date Received: May 6, 1988
Date Reported: May 24, 1988

Work Order: 622
Job No. : NC065

For: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88050845
Sample No.:	Peterson Asp
Date Sampled:	5-06-88
Time Sampled:	03:30
Date Extracted:	5-09-88
Date Analyzed:	5-20-88

Compound	Detection Limits mg/kg	Analytical Results mg/kg
Acetophenone	--*	ND
Aniline	--*	ND
4-Aminobiphenyl	--*	ND
4-Chloroaniline	3.25	ND
2-Chloronaphthalene	--*	ND
Dibenzofuran	1.66	ND
p-Dimethylaminoazobenzene	--*	ND
7,12-Dimethylbenz(a)anthracene	--*	ND
a-,a-Dimethylphenethylamine	--*	ND
Diphenylamine	--*	ND
1,2-Diphenylhydrazine	--*	ND
Ethyl methanesulfonate	--*	ND
3-Methylcholanthrene	--*	ND
Methyl methanesulfonate	--*	ND
2-Methylnaphthalene	1.66	ND
1-Naphthylamine	--*	ND
2-Naphthylamine	--*	ND
2-Nitroaniline	8.25	ND
3-Nitroaniline	8.25	ND
4-Nitroaniline	8.25	ND
N-Nitroso-di-n-butylamine	--*	ND
N-Nitrosopiperidine	--*	ND
Pentachlorobenzene	--*	ND
Pentachloronitrobenzene	--*	ND
Phenacetin	--*	ND
2-Picoline	--*	ND
Pronamide	--*	ND
1,2,4,5-Tetrachlorobenzene	--*	ND

*EPA has not yet determined detection limits for these compounds.

Priority Pollutant Analysis
Pesticides and PCBs - SW 8270
Matrix: Soil

Date Received: May 6, 1988
Date Reported: May 24, 1988

Work Order: 622
Job No. : NC065

FOR: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN:Mr. Dan McCullar

Lab Number:	88050845
Sample No.:	Peterson Asp
Date Sampled:	5-06-88
Time Sampled:	03:30
Date Extracted:	5-09-88
Date Analyzed:	5-20-88

Compound	Detection Limits mg/kg	ANALYTICAL RESULTS mg/kg
Alpha-BHC	--*	ND
Gamma-BHC	--*	ND
Beta-BHC	1.0	ND
Heptachlor	0.5	ND
Delta-BHC	0.8	ND
Aldrin	0.5	ND
Heptachlor epoxide	0.5	ND
Endosulfan I	--*	ND
Dieldrin	0.8	ND
4,4'-DDE	1.5	ND
Endrin	--*	ND
Endosulfan II	--*	ND
4,4'-DDD	0.8	ND
4,4'-DDT	1.3	ND
Endosulfan Sulfate	1.5	ND
Endrin aldehyde	--*	ND
Endrin Ketone	--*	ND
Chlordane	10	ND
Methoxychlor	--*	ND
Toxaphene	10	ND
Aroclor-1016	10	ND
Aroclor-1221	10	ND
Aroclor-1232	10	ND
Aroclor-1242	10	ND
Aroclor-1248	10	ND
Aroclor-1254	10	ND
Aroclor-1260	10	ND

* EPA has not yet determined detection limits for these compounds.

Priority Pollutant Analysis
Acid Extractables -- SW 8270
Matrix: Soil

Date Received: May 6, 1988
Date Reported: May 24, 1988

Work Order: 622
Job No. : NC065

FOR: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88050845
Sample No.:	Peterson Asp
Date Sampled:	5-06-88
Time Sampled:	03:30
Date Extracted:	5-09-88
Date Analyzed:	5-20-88

Compound	Detection Limits mg/kg	ANALYTICAL RESULTS mg/kg
2-Chlorophenol	1.66	ND
2-Nitrophenol	1.66	ND
Phenol	1.66	ND
2,4-Dimethylphenol	1.66	ND
2,4-Dichlorophenol	1.66	ND
2,4,6-Trichlorophenol	1.66	ND
4-Chloro-3-methylphenol	3.25	ND
2,4-Dinitrophenol	8.25	ND
2,6-Dichlorophenol	--*	ND
2-Methyl-4,6-Dinitrophenol	8.25	ND
Pentachlorophenol	8.25	ND
4-Nitrophenol	8.25	ND
Benzoic Acid	8.25	ND
2-Methylphenol	1.66	ND
3- & 4-Methylphenol	1.66	ND
2,3,4,6-Tetrachlorophenol	--*	ND
2,4,5-Trichlorophenol	1.66	ND

Laura Kuck
Analyst

Laboratory Supervisor

*EPA has not yet determined detection limits for these compounds.

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: May 6, 1988
Date Reported: May 24, 1988

Work Order : 622
Job No. : NC065

For: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88050845
Sample No.:	Peterson Asp
Date Sampled:	5-06-88
Time Sampled:	03:30
Date Analyzed:	5-20-88

Compound	Detection Limit ug/kg	Analytical Results ug/kg
Chloromethane	1250	ND
Bromomethane	1250	ND
Vinyl Chloride	1250	ND
Chloroethane	1250	ND
Dichloromethane	625	ND
Trichlorofluoromethane	1250	ND
1,1-Dichloroethene	625	ND
1,1-Dichloroethane	625	ND
trans-1,2-Dichloroethene	625	ND
Chloroform	625	ND
1,2-Dichloroethane	625	ND
1,1,1-Trichloroethane	625	ND
Carbon Tetrachloride	625	ND
Bromodichloromethane	625	ND
1,2-Dichloropropane	625	ND
trans-1,3-Dichloropropene	625	ND
Trichloroethene	625	ND
Benzene	625	ND
Dibromochloromethane	625	ND
1,1,2-Trichloroethane	625	ND
cis-1,3-Dichloropropene	625	ND
2-Chloroethyl vinyl ether	1250	ND
Bromoform	625	ND
1,1,2,2-Tetrachloroethane	625	ND
Tetrachloroethene	625	ND
Toluene	625	ND
Chlorobenzene	625	ND
Ethylbenzene	625	ND
Styrene	625	ND
Total Xylenes	625	710

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - EPA 624 + Hexanes
Matrix: Water

Date Received: April 7, 1988
Date Reported: April 8, 1988
P.O. No.: .....
Job No. : NC065

For: ES:Berkeley/Wareham-Peterson
Address: 600 Bancroft Way
Berkeley, California 94710
Attn: Mr. Dan McCullar

Lab Number:	880728
Sample No.:	SP-SB3
Date Sampled:	4-7-88
Time Sampled:	1030
Date Analyzed:	4-8-88

Compound	Detection Limit ug/L	Analytical Results ug/L
Chloromethane	10	ND
Bromomethane	10	ND
Vinyl Chloride	10	ND
Chloroethane	10	ND
Dichloromethane	3	ND
Trichlorofluoromethane	10	ND
1,1-Dichloroethene	3	ND
1,1-Dichloroethane	5	ND
trans-1,2-Dichloroethene	2	ND
Chloroform	2	ND
1,2-Dichloroethane	3	ND
1,1,1-Trichloroethane	4	ND
Carbon Tetrachloride	3	ND
Bromodichloromethane	2	ND
1,2-Dichloropropane	5	ND
trans-1,3-Dichloropropene	5	ND
Trichloroethene	2	ND
Benzene	4	ND
Dibromochloromethane	3	ND
1,1,2-Trichloroethane	5	ND
cis-1,3-Dichloropropene	10	ND
2-Chloroethyl vinyl ether	10	ND
Bromoform	5	ND
1,1,2,2-Tetrachloroethane	7	ND
Tetrachloroethene	4	ND
Toluene	6	ND
Chlorobenzene	6	ND
Ethylbenzene	7	ND
1,2-Dichlorobenzene	10	ND
1,3- & 1,4-Dichlorobenzene	10	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - EPA 624 + Hexanes
Matrix: Water

Date Received: April 7, 1988
Date Reported: April 8, 1988

P.O. No.: .....
Job No. : NC065

For: ES:Berkeley/Wareham-Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880728
Sample No:	SP-SB3
Date Sampled:	4-7-88
Time Sampled:	1030
Date Analyzed:	4-8-88

Compound	Analytical Results ug/L
Additional Compounds Requested:*	
Cyclohexane	3
Methylcyclopentane	15
3-Methylpentane	7
2-Methylpentane	3
Hexane	13

Analyst

Laboratory Supervisor

*These are estimated concentrations as per CLP protocol.

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	D.B. McCullar	NC065.

PROJECT NAME / LOCATION: Peterson - Emeryville

SAMPLER(S): (SIGNATURE) Wayne Haucke, Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: 8240	418.1					PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
TF-3	4/1/88				2	✓	✓							
TF-4	"				3	✓	✓							
TF-2	"				3	✓	✓							
TF-5	"				2	✓	✓							

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Ajay Singh	April 5:34				

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		Bill Friedman	4/1/88 17:30	rec'd cold & intact

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work order 56
Verbal Rept - 4/5 @ 1:10PM

ES

ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01 Invoice # 458A

Client: ES Berkeley

Attention: Dan McCullar

Copy: Rick Makdisi

Project: Peterson Manufacturing

Attached are the analytical reports for the samples received by this laboratory on 4-01-88.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88040674	418.1	4-01-88	Not Given	4-04-88	4-04-88	
88040676	418.1	4-01-88	Not Given	4-04-88	4-04-88	
88040677	418.1	4-01-88	Not Given	4-04-88	4-04-88	

* If applicable

Detection Limits
Environmental Quality Parameters
Samples No.: 88040674, 88040676 - 88040677

Parameter	Units	Detection Limits
418.1		
Petroleum Hydrocarbons	mg/Kg	100

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: May 6, 1988
Date Reported: May 24, 1988

Work Order : 622
Job No.: NC065

For: ES Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	88050845
Sample No.:	Peterson Asp
Date Sampled:	5-06-88
Time Sampled:	03:30
Date Analyzed:	5-20-88

Compound	Detection Limits ug/kg	Analytical Results ug/kg
Acetone	12500	ND
Acrolein	1250	ND
Acrylonitrile	1250	ND
2-Butanone (MEK)	12500	ND
Carbon Disulfide	1250	ND
Dibromomethane	1250	ND
1,4-Dichloro-2-butene	1250	ND
Dichlorodifluoromethane	1250	ND
Ethyl methacrylate	1250	ND
2-Hexanone	6250	ND
Iodomethane	1250	ND
4-Methyl-2-pentanone	6250	ND
1,2,3-Trichloropropane	1250	ND
Vinyl acetate	6250	ND

Lana Kuck
Analyst

R D Burston
Laboratory Supervisor

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD 608

PAGE ___ OF ___

CLIENT: ENGINEERING-SCIENCE, INC. BERKELEY	PROJECT MANAGER: M. McCullar	PROJ. NO.: NC065

PROJECT NAME / LOCATION: WAREHAM PETERSON EMERYVILLE

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	608	624	GC-FID				PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
UST2-WRE	4/27/88		water	UST-2 excavation pit	2	✓								2 weeks turnaround
"	"		"	"	2		✓							period.
"	"		"	"	2			✓						
UST3-WRE	"		"	UST-3 excavation pit	2	✓								
"	"		"	"	2		✓							
"	"		"	"	2			✓						

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	4/27/88.				

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		Bill Freedman	4-27-88 12:00	rec'd cold & intact

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RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01
Client: ES Berkeley
Attention: Dan McCullar
Copy: Rick Makdisi
Project: Peterson Manufacturing

Attached are the analytical reports for the water samples received by this laboratory on 4-27-88.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88040808	608	4-27-88	Not Given	4-27-88	5-04-88	
88040808	GCFID	4-27-88	Not Given	4-28-88	5-02-88	
88040809	608	4-27-88	Not Given	4-27-88	5-04-88	
88040809	GCFID	4-27-88	Not Given	4-28-88	5-02-88	

* If applicable

Detection Limits
Organochlorine Pesticides & PCBs
EPA 8080/608
Samples No.: 88040808 & 88040809

Compound	Detection Limits
Aldrin	0.004 ug/L
Alpha-BHC	0.003
Beta-BHC	0.006
Delta-BHC	0.009
Gamma-BHC (Lindane)	0.004
Chlordane	0.014
4,4'-DDD	0.011
4,4'-DDE	0.004
4,4'-DDT	0.012
Dieldrin	0.002
Endosulfan I	0.014
Endosulfan II	0.004
Endosulfan sulfate	0.066
Endrin	0.006
Endrin aldehyde	0.023
Heptachlor	0.003
Heptachlor epoxide	0.083
Methoxychlor	0.176
Toxaphene	0.24
PCB-1016	0.5
PCB-1221	0.5
PCB-1232	0.5
PCB-1242	0.5
PCB-1248	0.5
PCB-1254	1.0
PCB-1260	1.0

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
FID Scan
Samples No.: 88040808 - 88040809

Compound	Detection
Petroleum Hydrocarbons	50 ug/L

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ANALYSIS REPORT

WORK ORDER NUMBER: 608
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 04/27/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 4, UNITS: ug/L, GROUP 608

TEST COMPOUND	VST2-WRE 4-27-88 88040808	VST3-WRE 4-27-88 88040809
ALDRIN	ND	ND
ALPHA-BHC	ND	ND
BETA-BHC	ND	ND
DELTA-BHC	ND	ND
GAMMA-BHC	ND	ND
4,4'-DDE	ND	ND
4,4'-DDT	ND	ND
DIELDRIN	ND	ND
ENDOSULFAN I	ND	ND
ENDOSULFAN II	ND	ND
ENDOSULFAN SULFATE	ND	ND
ENDRIN	ND	ND
ENDRIN ALDEHYDE	ND	ND
HEPTACHLOR	ND	ND
HEPTACHLOR EPOXIDE	ND	ND
TOXAPHENE	ND	ND
PCB-1016	ND	ND
PCB-1221	ND	ND
PCB-1232	ND	ND
PCB-1242	ND	ND
PCB-1248	ND	ND
PCB-1254	3.1	ND
PCB-1260	ND	ND

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 608

TASK: 4, UNITS: ug/L, GROUP GCFID

TEST COMPOUND	VST2-WRE 4-27-88 88040808	VST3-WRE 4-27-88 88040809
GC PETROLEUM HYDROCARBONS	3,600	13,000

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - EPA 624
Matrix: Water

Date Received: April 27, 1988
Date Reported: May 10, 1988

Work Order : 608
Job No. : NC065

For: ES:Berkeley/Wareham Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

Attn: Mr. Dan McCullar
cc: Mr. Rick Makdisi

Lab Number:		880808	880809
Sample No.:		UST2-WRE	UST3-WRE
Date Sampled:		4-27-88	4-27-88
Time Sampled:		Not Supplied	Not Supplied
Date Analyzed:		5-06-88	5-06-88
Compound	Detection Limit ug/L	Analytical Results ug/L	ug/L
Chloromethane	200	ND	ND
Bromomethane	200	ND	ND
Vinyl Chloride	200	ND	ND
Chloroethane	200	ND	ND
Dichloromethane	60	ND	ND
Trichlorofluoromethane	200	ND	ND
1,1-Dichloroethene	60	ND	ND
1,1-Dichloroethane	100	ND	ND
trans-1,2-Dichloroethene	40	ND	ND
Chloroform	40	ND	ND
1,2-Dichloroethane	60	ND	ND
1,1,1-Trichloroethane	80	ND	ND
Carbon Tetrachloride	60	ND	ND
Bromodichloromethane	40	ND	ND
1,2-Dichloropropane	100	ND	ND
trans-1,3-Dichloropropene	100	ND	ND
Trichloroethene	40	ND	ND
Benzene	80	810	540
Dibromochloromethane	60	ND	ND
1,1,2-Trichloroethane	100	ND	ND
cis-1,3-Dichloropropene	200	ND	ND
2-Chloroethyl vinyl ether	200	ND	ND
Bromoform	100	ND	ND
1,1,2,2-Tetrachloroethane	140	ND	ND
Tetrachloroethene	80	ND	ND
Toluene	120	1100	1100
Chlorobenzene	120	ND	ND
Ethylbenzene	140	ND	ND
1,2-Dichlorobenzene	200	ND	ND
1,3- & 1,4-Dichlorobenzene	200	ND	ND
Total Xylenes	200	2200	2400

Laura Kuck
Analyst

Laboratory Supervisor

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD 591

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	N1065

PROJECT NAME / LOCATION: Wareham Development - Peterson.

SAMPLER(S): (SIGNATURE) Ajay Singh.

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: EPA 624	EPA 602	EPA 8020	EPA 8240			PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
UST-1W	04/15/88	1:35.	water	UST-④ Excavation pit	2.	✓								
" 1W	"	1:30	"	"	2	1	✓					Yes.		
UST-2WB	"	2:00	"	UST-2 Excavation pit	2		✓							
UST-1SIDE	"	12:30	Soil	West side of UST-④ 1	1			✓						
"	"	"	"	"	1				✓					

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	04/15/88 5:00				

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		Bill Svedsen	4-15-88 17:00	recd intact

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RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01 Invoice #
Client: ES Berkeley
Attention: Dan McCullar
Copy: Rick Makdisi
Project: Peterson Manufacturing

Attached are the analytical reports for the water and soil samples received by this laboratory on 4-18-88.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88040772	608	4-15-88	1:35	4-18-88	4-19-88	
88040773	608	4-15-88	2:00	4-18-88	4-19-88	
88040774	8080	4-15-88	12:30	4-17-88	4-19-88	

* If applicable

Detection Limits
Organochlorine Pesticides & PCBs
EPA 8080
Samples No.: 88040772, 88040773

Compound	Detection Limits
Aldrin	0.04 ug/L
Alpha-BHC	0.03
Beta-BHC	0.06
Delta-BHC	0.09
Gamma-BHC (Lindane)	0.04
Chlordane	0.14
4,4'-DDD	0.11
4,4'-DDE	0.04
4,4'-DDT	0.12
Dieldrin	0.02
Endosulfan I	0.14
Endosulfan II	0.04
Endosulfan sulfate	0.66
Endrin	0.06
Endrin aldehyde	0.23
Heptachlor	0.03
Heptachlor epoxide	0.83
Methoxychlor	1.76
Toxaphene	2.4
PCB-1016	5
PCB-1221	5
PCB-1232	5
PCB-1242	5
PCB-1248	5
PCB-1254	10
PCB-1260	10

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
Organochlorine Pesticides & PCBs
EPA 8080
Sample No.: 88040774

Compound	Detection Limits
Aldrin	26.8* ug/Kg
Alpha-BHC	20.1*
Beta-BHC	40.2*
Delta-BHC	60.3*
Gamma-BHC (Lindane)	26.8*
Chlordane	93.8*
4,4'-DDD	7.37
4,4'-DDE	2.68
4,4'-DDT	8.04
Dieldrin	1.34
Endosulfan I	93.8*
Endosulfan II	2.68
Endosulfan sulfate	44.2
Endrin	4.02
Endrin aldehyde	15.4
Heptachlor	20.1*
Heptachlor epoxide	556
Methoxychlor	118
Toxaphene	161
PCB-1016	100*
PCB-1221	100*
PCB-1232	100*
PCB-1242	100*
PCB-1248	100*
PCB-1254	20
PCB-1260	20

* Detection limit is 10 x higher because of matrix interferences in the early portion of the chromatogram. These interferences were not removable by normal cleanup procedures.

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING SCIENCE INC.
04/22/88

ANALYSIS REPORT

WORK ORDER NUMBER: 591
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 04/18/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 4, UNITS: ug/KG, GROUP 8080

UST-1SA
~~UST-4W~~ SIDE

TEST COMPOUND	88040774
ALDRIN	ND
ALPHA-BHC	ND
BETA-BHC	ND
DELTA-BHC	ND
GAMMA-BHC	ND
CHLORDANE	ND
4,4'-DDD	ND
4,4'-DDE	ND
4,4'-DDT	ND
DIELDRIN	ND
ENDOSULFAN I	ND
ENDOSULFAN II	ND
ENDOSULFAN SULFATE	ND
ENDRIN	ND
ENDRIN ALDEHYDE	ND
HEPTACHLOR	ND
HEPTACHLOR EPOXIDE	ND
KEPONE	ND
METHOXYCHLOR	ND
TOXAPHENE	ND
PCB-1016	ND
PCB-1221	ND
PCB-1232	ND
PCB-1242	ND
PCB-1248	ND
PCB-1254	ND
PCB-1260	ND

ANALYSIS REPORT FOR WORK ORDER NUMBER 591

TASK: 4, UNITS: ug/L, GROUP 608

TEST COMPOUND	~~VST-4W~~ UST-1W 88040772	VST-2W 88040773
ALDRIN	ND	ND
ALPHA-BHC	ND	ND
BETA-BHC	ND	ND
DELTA-BHC	ND	ND
GAMMA-BHC	ND	ND
4,4'-DDE	ND	ND
4,4'-DDT	ND	ND
DIELDRIN	ND	ND
ENDOSULFAN I	ND	ND
ENDOSULFAN II	ND	ND
ENDOSULFAN SULFATE	ND	ND
ENDRIN	ND	ND
ENDRIN ALDEHYDE	ND	ND
HEPTACHLOR	ND	ND
HEPTACHLOR EPOXIDE	ND	ND
TOXAPHENE	ND	ND
PCB-1016	ND	ND
PCB-1221	ND	ND
PCB-1232	ND	ND
PCB-1242	ND	ND
PCB-1248	ND	ND
PCB-1254	ND	ND
PCB-1260	ND	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 15, 1988
Date Reported: April 19, 1988

P.O. No.: .....
Job No. : NC065

For: ES:Berkeley/Peterson-Wareham
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880774
Sample No.:	UST-4WSIDE
Date Sampled:	4-15-88
Time Sampled:	12:30
Date Analyzed:	4-19-88

Compound	Detection Limit ug/kg	Analytical Results ug/kg
Chloromethane	50	ND
Bromomethane	50	ND
Vinyl Chloride	50	ND
Chloroethane	50	ND
Dichloromethane	25	ND
Trichlorofluoromethane	50	ND
1,1-Dichloroethene	25	ND
1,1-Dichloroethane	25	ND
trans-1,2-Dichloroethene	25	ND
Chloroform	25	ND
1,2-Dichloroethane	25	ND
1,1,1-Trichloroethane	25	ND
Carbon Tetrachloride	25	ND
Bromodichloromethane	25	ND
1,2-Dichloropropane	25	ND
trans-1,3-Dichloropropene	25	ND
Trichloroethene	25	ND
Benzene	25	ND
Dibromochloromethane	25	ND
1,1,2-Trichloroethane	25	ND
cis-1,3-Dichloropropene	25	ND
2-Chloroethyl vinyl ether	50	ND
Bromoform	25	ND
1,1,2,2-Tetrachloroethane	25	ND
Tetrachloroethene	25	ND
Toluene	25	ND
Chlorobenzene	25	ND
Ethylbenzene	25	ND
Styrene	25	ND
Total Xylenes	25	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 15, 1988
Date Reported: April 19, 1988

P.O. No.:.....
Job No.: NC065

For: ES:Berkeley/Peterson-Wareham
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880774
Sample No.:	UST-4WSIDE
Date Sampled:	4-15-88
Time Sampled:	12:30
Date Analyzed:	4-19-88

Compound	Detection Limits ug/kg	Analytical Results ug/kg
Acetone	500	ND
Acrolein	50	ND
Acrylonitrile	50	ND
2-Butanone (MEK)	500	ND
Carbon Disulfide	50	ND
Dibromomethane	50	ND
1,4-Dichloro-2-butene	50	ND
Dichlorodifluoromethane	50	ND
Ethyl methacrylate	50	ND
2-Hexanone	250	ND
Iodomethane	50	ND
4-Methyl-2-pentanone	250	ND
1,2,3-Trichloropropane	50	ND
Vinyl acetate	250	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 15, 1988 P.O. No.: .....
Date Reported: April 19, 1988 Job No. : NC065

For: ES:Berkeley/Peterson-Wareham ATTN: Mr. Dan McCullar
Address: 600 Bancroft Way
Berkeley, California 94710

Lab Number:	880774
Sample No.:	UST-4WSIDE
Date Sampled:	4-15-88
Time Sampled:	12:30
Date Analyzed:	4-19-88

Compound	Analytical Results ug/kg
Additional Compounds Requested:*	
Cyclohexane	36
Methylcyclopentane	24
2,3-dimethylbutane	48
3-Methylpentane	ND
2-Methylpentane	24
Hexane	37

Analyst

Laboratory Supervisor

*These are estimated concentrations as per CLP protocol.

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - EPA 624 + Hexanes
Matrix: Water

Date Received: April 15, 1988
Date Reported: April 19, 1988

P.O. No.: .....
Job No. : NC065

For: ES:Berkeley/Peterson-Wareham
Address: 600 Bancroft Way
Berkeley, California 94710

Attn: Mr. Dan McCullar

Lab Number:	880772
Sample No.:	UST-4W
Date Sampled:	4-15-88
Time Sampled:	1:35
Date Analyzed:	4-18-88

Compound	Detection Limit ug/L	Analytical Results ug/L
Chloromethane	10	ND
Bromomethane	10	ND
Vinyl Chloride	10	ND
Chloroethane	10	ND
Dichloromethane	3	ND
Trichlorofluoromethane	10	ND
1,1-Dichloroethene	3	ND
1,1-Dichloroethane	5	ND
trans-1,2-Dichloroethene	2	ND
Chloroform	2	ND
1,2-Dichloroethane	3	ND
1,1,1-Trichloroethane	4	ND
Carbon Tetrachloride	3	ND
Bromodichloromethane	2	ND
1,2-Dichloropropane	5	ND
trans-1,3-Dichloropropene	5	ND
Trichloroethene	2	ND
Benzene	4	ND
Dibromochloromethane	3	ND
1,1,2-Trichloroethane	5	ND
cis-1,3-Dichloropropene	10	ND
2-Chloroethyl vinyl ether	10	ND
Bromoform	5	ND
1,1,2,2-Tetrachloroethane	7	ND
Tetrachloroethene	4	ND
Toluene	6	ND
Chlorobenzene	6	ND
Ethylbenzene	7	ND
1,2-Dichlorobenzene	10	ND
1,3- & 1,4-Dichlorobenzene	10	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - EPA 624 + Hexanes
Matrix: Water

Date Received: April 15, 1988
Date Reported: April 19, 1988

P.O. No.: .....
Job No. : NC065

For: ES:Berkeley/Peterson-Wareham
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880772
Sample No:	UST-4W
Date Sampled:	4-15-88
Time Sampled:	1:35
Date Analyzed:	4-18-88

Compound	Analytical Results ug/L
Additional Compounds Requested:*	
Cyclohexane	ND
Methylcyclopentane	ND
2,3-Dimethylbutane	ND
3-Methylpentane	ND
2-Methylpentane	ND
Hexane	ND

Analyst

Laboratory Supervisor

*These are estimated concentrations as per CLP protocol.

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065

PROJECT NAME / LOCATION: Wareham Peterson.

SAMPLER(S): (SIGNATURE) Ajay Singh.

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	GC-FID	EPA 608	EPA 624					REMARKS
						ANALYSES REQUIRED						PRESERVED	TO BE COMPOSITED BY LAB	
VSTI-WRE	4/29/88		Water		2	V								Two week turnaround
"	"		"		2		V							Period.
"	"		"		2			V						

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh.	4/29/88				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
			4/29/88	

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ES
ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01
Client: ES Berkeley
Attention: Dan McCullar
Copy: Rick Makdisi
Project: Peterson Manufacturing

Attached are the analytical reports for the water sample received by this laboratory on 4-29-88.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88040812	608	4-29-88	Not Given	4-30-88	5-04-88	
88040812	GCFID	4-29-88	Not Given	4-30-88	5-02-88	

* If applicable

Detection Limits
Organochlorine Pesticides & PCBs
EPA 8080/608
Sample No.: 88040812

Compound	Detection Limits
Aldrin	0.004 ug/L
Alpha-BHC	0.003
Beta-BHC	0.006
Delta-BHC	0.009
Gamma-BHC (Lindane)	0.004
Chlordane	0.014
4,4'-DDD	0.011
4,4'-DDE	0.004
4,4'-DDT	0.012
Dieldrin	0.002
Endosulfan I	0.014
Endosulfan II	0.004
Endosulfan sulfate	0.066
Endrin	0.006
Endrin aldehyde	0.023
Heptachlor	0.003
Heptachlor epoxide	0.083
Methoxychlor	0.176
Toxaphene	0.24
PCB-1016	0.5
PCB-1221	0.5
PCB-1232	0.5
PCB-1242	0.5
PCB-1248	0.5
PCB-1254	1.0
PCB-1260	1.0

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
FID Scan
Sample No.: 88040812

Compound	Detection
Petroleum Hydrocarbons	50 ug/L

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING SCIENCE INC.
05/09/88

ANALYSIS REPORT

WORK ORDER NUMBER: 611
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 04/29/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 4, UNITS: ug/L, GROUP 608

TEST COMPOUND	VST1-WRE 4-29-88 88040812
ALDRIN	ND
ALPHA-BHC	ND
BETA-BHC	ND
DELTA-BHC	ND
GAMMA-BHC	ND
4,4'-DDE	ND
4,4'-DDT	ND
DIELDRIN	ND
ENDOSULFAN I	ND
ENDOSULFAN II	ND
ENDOSULFAN SULFATE	ND
ENDRIN	ND
ENDRIN ALDEHYDE	ND
HEPTACHLOR	ND
HEPTACHLOR EPOXIDE	ND
TOXAPHENE	ND
PCB-1016	ND
PCB-1221	ND
PCB-1232	ND
PCB-1242	ND
PCB-1248	ND
PCB-1254	ND
PCB-1260	ND

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 611

TASK: 4, UNITS: ug/L, GROUP GCFID

TEST COMPOUND	VST1-WRE 4-29-88 88040812
GC PETROLEUM HYDROCARBONS	27,000

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - EPA Method 624
Matrix: Water

Date Received: April 29, 1988 Work Order : 611
Date Reported: May 10, 1988 Job No. : NC065

For: ES:Berkeley/Wareham Peterson Attn: Mr. Dan McCullar
Address: 600 Bancroft Way cc: Mr. Rick Makdisi
Berkeley, California 94710

Lab Number:	880812
Sample No.:	UST1-WRE
Date Sampled:	4-29-88
Time Sampled:	Not Supplied
Date Analyzed:	5-06-88

Compound	Detection Limit ug/L	Analytical Results ug/L
Chloromethane	10	ND
Bromomethane	10	ND
Vinyl Chloride	10	ND
Chloroethane	10	ND
Dichloromethane	3	ND
Trichlorofluoromethane	10	ND
1,1-Dichloroethene	3	ND
1,1-Dichloroethane	5	ND
trans-1,2-Dichloroethene	2	ND
Chloroform	2	ND
1,2-Dichloroethane	3	ND
1,1,1-Trichloroethane	4	ND
Carbon Tetrachloride	3	ND
Bromodichloromethane	2	ND
1,2-Dichloropropane	5	ND
trans-1,3-Dichloropropene	5	ND
Trichloroethene	2	ND
Benzene	4	ND
Dibromochloromethane	3	ND
1,1,2-Trichloroethane	5	ND
cis-1,3-Dichloropropene	10	ND
2-Chloroethyl vinyl ether	10	ND
Bromoform	5	ND
1,1,2,2-Tetrachloroethane	7	ND
Tetrachloroethene	4	ND
Toluene	6	ND
Chlorobenzene	6	ND
Ethylbenzene	7	ND
1,3-Dichlorobenzene	10	ND
1,2- & 1,4-Dichlorobenzene	10	ND
Total Xylenes	10	ND

Laura Kuck
Analyst

Laboratory Supervisor

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Don McCullar	NCO85-

PROJECT NAME / LOCATION: Peterson - Wareham Development

SAMPLER(S): (SIGNATURE) Ajay Singh

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: GC-FID	608	624			PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
Well	4/13/88	12:00	Water	Production Well	3	✓							
"	"	12:00	"	"	2		✓						
"	"	12:00	"	"	2			✓					

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Ajay Singh	4-13-88 16:10				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Friedman	4-13-88 15:10	rec'd cold & intact

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4/18 original accompanies

ES
ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01
Client: ES Berkeley
Attention: Dan McCullar
Copy: Rick Makdisi
Project: Peterson Manufacturing

Attached are the analytical reports for the water sample received by this laboratory on 4-13-88.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88040750	608	4-13-88	12:00	4-14-88	4-14-88	
88040750	GCFID	4-13-88	12:00	4-14-88	4-14-88	

* If applicable

Detection Limits
Organochlorine Pesticides & PCBs
EPA 8080
Sample No.: 88040750
Dilution: 1/10 because of PCBs level

Compound	Detection Limits
Aldrin	0.4 ug/L
Alpha-BHC	0.3
Beta-BHC	0.6
Delta-BHC	0.9
Gamma-BHC (Lindane)	0.4
Chlordane	1.4
4,4'-DDD	1.1
4,4'-DDE	0.4
4,4'-DDT	1.2
Dieldrin	0.2
Endosulfan I	1.4
Endosulfan II	0.4
Endosulfan sulfate	6.6
Endrin	0.6
Endrin aldehyde	2.3
Heptachlor	0.3
Heptachlor epoxide	8.3
Methoxychlor	17.6
Toxaphene	24
PCB-1016	50
PCB-1221	50
PCB-1232	50
PCB-1242	50
PCB-1248	50
PCB-1254	100
PCB-1260	100

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
Environmental Quality Parameters
Sample No.: 88040750

Parameter	Units	Detection Limits
GCFID*	ug/L	50

* The standard for GCFID analysis is #2 diesel.

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING SCIENCE INC.
04/2[illegible]/88

ANALYSIS REPORT

WORK ORDER NUMBER: 586
JOB NUMBER : 710000000560
WORK ORDER DATE : 04/13/88

APPROVED BY RWBurton
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLOH

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. ([illegible] 39)
600 BANCROFT WAY
BERKELEY, CA 94710

OF SAMPLES REPORTED: 1

CONTRACT / PO # : ND065.01
CONTACT : DAN McCULLOH
(415) 548-7970

TABLE: 4, UNITS: ug/L, GROUP 608

TEST COMPOUND	PRODUCTION WELL [illegible]-88 8804[illegible]
ALDRIN	ND
ALPHA-BHC	ND
BETA-BHC	ND
DELTA-BHC	ND
GAMMA-BHC	ND
4,4'-DDD	ND
4,4'-DDT	ND
DIELDRIN	ND
ENDOSULFAN I	ND
ENDOSULFAN II	ND
ENDOSULFAN SULFATE	ND
ENDRIN	ND
ENDRIN ALDEHYDE	ND
HEPTACHLOR	ND
HEPTACHLOR EPOXIDE	ND
TOXAPHENE	ND
PCB-1016	ND
PCB-1221	ND
PCB-1232	ND
PCB-1242	ND
PCB-1248	ND
PCB-1254	29
PCB-1260	ND

ANALYSIS REPORT FOR WORK ORDER NUMBER 586

[illegible] UNIT [illegible] mg/L, DRY WEIGHT BASIS

	PRODUCTION WELL
	4-13-93
[illegible] COMPOUND	[illegible]
[illegible]	[illegible]
60 PETROLEUM HYDROCARBONS	[illegible]

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - EPA 624 + Hexanes
Matrix: Water

Date Received: April 13, 1988
Date Reported: April 19, 1988

P.O. No.: .....
Job No. : NC065

For: ES:Berkeley/Peterson-Wareham
Address: 600 Bancroft Way
Berkeley, California 94710

Attn: Mr. Dan McCullar

Lab Number:	880750
Sample No.:	Well
Date Sampled:	4-13-88
Time Sampled:	12:00
Date Analyzed:	4-18-88

Compound	Detection Limit ug/L	Analytical Results ug/L
Chloromethane	10	ND
Bromomethane	10	ND
Vinyl Chloride	10	ND
Chloroethane	10	ND
Dichloromethane	3	ND
Trichlorofluoromethane	10	ND
1,1-Dichloroethene	3	ND
1,1-Dichloroethane	5	ND
trans-1,2-Dichloroethene	2	ND
Chloroform	2	ND
1,2-Dichloroethane	3	ND
1,1,1-Trichloroethane	4	ND
Carbon Tetrachloride	3	ND
Bromodichloromethane	2	ND
1,2-Dichloropropane	5	ND
trans-1,3-Dichloropropene	5	ND
Trichloroethene	2	ND
Benzene	4	7
Dibromochloromethane	3	ND
1,1,2-Trichloroethane	5	ND
cis-1,3-Dichloropropene	10	ND
2-Chloroethyl vinyl ether	10	ND
Bromoform	5	ND
1,1,2,2-Tetrachloroethane	7	ND
Tetrachloroethene	4	ND
Toluene	6	ND
Chlorobenzene	6	ND
Ethylbenzene	7	ND
1,2-Dichlorobenzene	10	ND
1,3- & 1,4-Dichlorobenzene	10	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - EPA 624 + Hexanes
Matrix: Water

Date Received: April 13, 1988
Date Reported: April 19, 1988

P.O. No.: .....
Job No. : NC065

For: ES:Berkeley/Peterson-Wareham
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880750
Sample No:	Well
Date Sampled:	4-13-88
Time Sampled:	12:00
Date Analyzed:	4-18-88

Compound	Analytical Results ug/L
Additional Compounds Requested:*	
Cyclohexane	170
Methylcyclopentane	340
2,3-Dimethylbutane	30
3-Methylpentane	130
2-Methylpentane	220
Hexane	340

Analyst

Laboratory Supervisor

*These are estimated concentrations as per CLP protocol.

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

Chain of Custody Form

Curtis & Tompkins, Ltd
290 Division Street
San Francisco, CA 94103
(415) 861-1863

Samplers: AJAY SINGH

Job Description: WAREHAM PETERSON

Job Number: NC065.13

Client Contact: DAN B. MCCULLAR

Recorder:

Matrix: Water	Soil	Waste	Oil			#Containers	Method Preserved: H_2SO_4	HNO_3	Ice	None	Other	Sample Number	Sampling Date: Yr	Mo	Dy	Time	SAMPLE NOTES
	X					1			X	X		UST-2SA	88	04	12	330	MUST HAVE RESULTS BY FRIDAY 4/15
	X					1			X			UST-2SB	88	04	12	325	
	X					1			X			UST-3SA	88	04	12	310	
	X					1			X			UST-3SB	88	04	12	310	
	X					1			X			UST-4SA	88	04	12	240	
	X					1			X			UST-4SB	88	04	12	240	
X						2			X			UST-2WA	88	04	12	350	
X						2			X			UST-3WA	88	04	12	345	
X						2			X			UST-4WA	88	04	12	340	

ANALYSIS REQUESTED	EPA 601/8010	EPA 602/8020 BTX	EPA 624/8240	EPA 625/8270	CAM 17 Metals	EPA PP Metals (#)	TPH Method-	Benzene-Toluene-Xylene(s)	Oil and Grease	EPA 608/8080 Pest's&PCB's	MODIFIED 8015 (TPH) Gasoline Diesel
		X									X
		X									X
		X									X
		X									X
		X									X
		X									X
		X									
		X									
		X									

Laboratory Notes :

Engineering-Science
600 Bancroft Way
Berkeley, CA 94710

548-7970

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
D. McCullar 4/12 6:28 PM	
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received for Lab by (signature) 4/12/88 11:25

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

JOB NUMBER: 14513
CLIENT: ENGINEERING-SCIENCE
JOB #: NC065.13, WAREHAM PETERSON

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/13/88
DATE REPORTED: 04/15/88

Results of Analysis for Petroleum Hydrocarbons

Method References: TPH: Total Petroleum Hydrocarbons, EPA 3510/8015

LAB ID	SAMPLE ID	GASOLINE (mg/Kg)	KEROSINE (mg/Kg)	DIESEL (mg/Kg)
14513-1	UST-2SA	350*	ND(10)	ND(10)
14513-2	UST-2SB	ND(10)	ND(10)	ND(10)
14513-3	UST-3SA	ND(10)	ND(10)	170
14513-4	UST=3SB	ND(10)	ND(10)	ND(10)
14513-5	UST-4SA	ND(10)	ND(10)	ND(10)
14513-6	UST-4SB	ND(10)	ND(10)	ND(10)

*FINGERPRINT PATTERN DOES NOT MATCH HYDROCARBON STD. QUANTITATION IS BASED ON LARGEST PEAKS WITHIN BOILING RANGE OF HYDROCARBON STD., C9-C14.

ND = NONE DETECTED. LIMIT OF DETECTION IS INDICATED IN PARENTHESES.

QA/QC SUMMARY

Duplicate: Relative % Difference	2
Spike: % Recovery	91

Laboratory Director

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14513-1
CLIENT: ENGINEERING-SCIENCE
SAMPLE ID: UST-2SA
Job #: NC065.13

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/13/88
DATE REPORTED: 04/15/88

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene	150	50
Toluene	ND	250
Ethyl Benzene	ND	50
Total Xylenes	ND	50
Chlorobenzene	ND	50
1,4-Dichlorobenzene	ND	50
1,3-Dichlorobenzene	ND	50
1,2-Dichlorobenzene	ND	50

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference	7
Average Spike Recovery %	91

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14513-2
CLIENT: ENGINEERING-SCIENCE
SAMPLE ID: UST-2SB
Job #: NC065.13

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/13/88
DATE REPORTED: 04/15/88

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene	ND	1
Toluene	ND	5
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference	7
Average Spike Recovery %	91

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14513-3
CLIENT: ENGINEERING-SCIENCE
SAMPLE ID: UST-3SA
Job #: NC065.13

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/13/88
DATE REPORTED: 04/15/88

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene	ND	50
Toluene	ND	250
Ethyl Benzene	ND	50
Total Xylenes	ND	50
Chlorobenzene	ND	50
1,4-Dichlorobenzene	ND	50
1,3-Dichlorobenzene	ND	50
1,2-Dichlorobenzene	ND	50

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference	7
Average Spike Recovery %	91

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14513-4
CLIENT: ENGINEERING-SCIENCE
SAMPLE ID: UST-3SB
Job #: NC065.13

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/13/88
DATE REPORTED: 04/15/88

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene	ND	1
Toluene	ND	5
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference	7
Average Spike Recovery %	91

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14513-5
CLIENT: ENGINEERING-SCIENCE
SAMPLE ID: UST-4SA
Job #: NC065.13

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/13/88
DATE REPORTED: 04/15/88

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene	ND	1
Toluene	ND	5
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference	7
Average Spike Recovery %	91

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14513-6
CLIENT: ENGINEERING-SCIENCE
SAMPLE ID: UST-4SB
Job #: NC065.13

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/13/88
DATE REPORTED: 04/15/88

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene	ND	1
Toluene	ND	5
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference	7
Average Spike Recovery %	91

Curtis & Tompkins, Ltd.

LAB NUMBER: 14513
CLIENT: ENGINEERING-SCIENCE
JOB #: NC065.13

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/15/88
DATE REPORTED: 04/18/88

POLYCHLORINATED BIPHENYLS (PCB'S)
METHOD: EPA 8080
EXTRACTION METHOD: EPA 3550-SONICATION

C&T ID	CLIENT ID	AROCLOR TYPE	CONCENTRATION (mg/Kg)	MDL (mg/Kg)
14513-1	UST-2SA	1016	ND	<1
		1221	ND	<1
		1232	ND	<1
		1242	ND	<1
		1248	ND	<1
		1254	ND	<1
		1260	ND	<1
		1262	ND	<1
14513-3	UST-3SA	1016	ND	<1
		1221	ND	<1
		1232	ND	<1
		1242	ND	<1
		1248	ND	<1
		1254	ND	<1
		1260	ND	<1
		1262	ND	<1

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14513-7
CLIENT: ENGINEERING-SCIENCE
SAMPLE ID: UST-2W
JOB #: NC065.13

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/14/88
DATE REPORTED: 04/15/88

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	CONC ug/L	DETECTION LIMIT ug/L
Benzene	3,100	200
Toluene	4,400	1000
Ethyl Benzene	3,000	200
Total Xylenes	21,000	200
Chlorobenzene	ND	200
1,4-Dichlorobenzene	ND	200
1,3-Dichlorobenzene	ND	200
1,2-Dichlorobenzene	ND	200

ND = None Detected

QA/QA:

DUPLICATE: RELATIVE % DIFFERENCE	7
AVERAGE SPIKE RECOVERY %	91

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14513-8
CLIENT: ENGINEERING-SCIENCE
SAMPLE ID: UST-3W
JOB #: NC065.13

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/14/88
DATE REPORTED: 04/15/88

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	CONC ug/L	DETECTION LIMIT ug/L
Benzene	1,100	200
Toluene	640	1000
Ethyl Benzene	1,200	200
Total Xylenes	7,000	200
Chlorobenzene	ND	200
1,4-Dichlorobenzene	ND	200
1,3-Dichlorobenzene	ND	200
1,2-Dichlorobenzene	ND	200

ND = None Detected

QA/QA:

DUPLICATE: RELATIVE % DIFFERENCE	7
AVERAGE SPIKE RECOVERY %	91

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14513-9
CLIENT: ENGINEERING-SCIENCE
SAMPLE ID: UST-4W
JOB #: NC065.13

DATE RECEIVED: 04/12/88
DATE ANALYZED: 04/14/88
DATE REPORTED: 04/15/88

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	CONC ug/L	DETECTION LIMIT ug/L
Benzene	19	1
Toluene	ND	5
Ethyl Benzene	ND	1
Total Xylenes	18	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QA:

DUPLICATE: RELATIVE % DIFFERENCE	7
AVERAGE SPIKE RECOVERY %	91

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD 578

PAGE ___ OF ___

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCollar	NC065.01

PROJECT NAME / LOCATION: Peterson / Emeryville

SAMPLER(S): (SIGNATURE) Lynne Hanick

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: 8240	~~8080~~ PCB's	GC/FID				PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
HT-1	4/7/88	14:20	Soil		1	✓	✓	✓						880736
HT-2	↓	14:22	↓		1	✓	✓	✓						880737
HT-3	↓	14:24	↓		1	✓	✓	✓						880738

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Lynne Hanick	4/7/88 17:48				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Friedman	4/7/88 17:48	~~48hr~~ 4 Day turnaround. for all analyses, rec'd intact

DISTRIBUTION: ORIGINAL ACCOMPANIES SHIPMENT; COPY TO COORDINATOR FIELD FILES

Detection Limits
PCBs
EPA 608/8080
Sample No.: 88040736

Compound	Detection Limits
PCB-1016	200 ug/Kg
PCB-1221	200 ug/Kg
PCB-1232	10 ug/Kg
PCB-1242	10 ug/Kg
PCB-1248	10 ug/Kg
PCB-1254	20 ug/Kg
PCB-1260	20 ug/Kg

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01
Client: ES Berkeley
Attention: Dan McCullar

Copy: Rick Makdisi
Project: Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 4-07-88.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88040736	GCFID	4-07-88	14:20	4-09-88	4-12-88	
88040736	PCB	4-07-88	14:20	4-08-88	4-12-88	
88040737	GCFID	4-07-88	14:22	4-09-88	4-12-88	
88040737	PCB	4-07-88	14:22	4-08-88	4-12-88	
88040738	GCFID	4-07-88	14:24	4-09-88	4-12-88	
88040738	PCB	4-07-88	14:24	4-08-88	4-12-88	

* If applicable

Detection Limits
Environmental Quality Parameters
Samples No.: 88040736-88040738

Parameter	Units	Detection Limits
GC Petroleum Hydrocarbons	ug/Kg	10,000

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
PCBs
EPA 608/8080
Samples No.: 88040737-88040738

Compound	Detection Limits
PCB-1016	50 ug/Kg
PCB-1221	50 ug/Kg
PCB-1232	10 ug/Kg
PCB-1242	10 ug/Kg
PCB-1248	10 ug/Kg
PCB-1254	20 ug/Kg
PCB-1260	20 ug/Kg

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING SCIENCE INC.

04/19.88

ANALYSIS REPORT

WORK ORDER NUMBER: 578
JOB NUMBER : Z60000000360
WORK ORDER DATE : 04/07/88

APPROVED BY ______________ Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. ([illegible] 34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

[illegible] 4, [illegible] mg/KG, GRAB SOLID

	HT-1	HT-2	HT-3
TEST COMPOUND	88040736	88040737	88040738
GC PETROLEUM HYDROCARBONS	35,000	26,000	260000

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

ate Received: April 7, 1988
ate Reported: April 18, 1988

P.O. No.: .....
Job No. : NC065.01

or: ES:Berkeley/Peterson/Emeryville
ddress: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

ab Number:	880736	880737
ample No.:	HT-1	HT-2
Date Sampled:	4-7-88	4-7-88
ime Sampled:	14:20	14:22
ate Analyzed:	4-15-88	4-15-88

Compound	Detection Limit ug/kg	Analytical Results ug/kg	ug/kg
hloromethane	10	ND	ND
romomethane	10	ND	ND
Vinyl Chloride	10	ND	ND
hloroethane	10	ND	ND
ichloromethane	5	ND	ND
Trichlorofluoromethane	10	ND	ND
,1-Dichloroethene	5	ND	ND
,1-Dichloroethane	5	ND	ND
rans-1,2-Dichloroethene	5	ND	ND
Chloroform	5	ND	ND
,2-Dichloroethane	5	ND	ND
,1,1-Trichloroethane	5	ND	ND
Carbon Tetrachloride	5	ND	ND
romodichloromethane	5	ND	ND
,2-Dichloropropane	5	ND	ND
trans-1,3-Dichloropropene	5	ND	ND
Trichloroethene	5	ND	ND
enzene	5	ND	ND
ibromochloromethane	5	ND	ND
1,1,2-Trichloroethane	5	ND	ND
is-1,3-Dichloropropene	5	ND	ND
-Chloroethyl vinyl ether	10	ND	ND
Bromoform	5	ND	ND
,1,2,2-Tetrachloroethane	5	ND	ND
etrachloroethene	5	ND	ND
Toluene	5	ND	ND
Chlorobenzene	5	ND	ND
thylbenzene	5	ND	ND
tyrene	5	ND	ND
Total Xylenes	5	ND	6

ENGINEERING SCIENCE, INC.
04/1[illegible]/88

ANALYSIS REPORT FOR WORK ORDER NUMBER 578

TABLE [illegible], UNITS: ug/L, GROUP PCB

TEST COMPOUND	HT-1 8804[illegible]36	HT-2 8804[illegible]37	HT-3 8804073
PCB-1016	ND	ND	ND
PCB-1221	ND	ND	ND
PCB-1232	ND	ND	ND
PCB-1242	ND	ND	ND
PCB-1248	ND	ND	ND
PCB-1254	ND	ND	ND
PCB-1260	78	4[illegible]	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988
Date Reported: April 18, 1988

P.O. No.: .....
Job No.: NC065.01

For: ES:Berkeley/Peterson/Emeryville
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880736	880737
Sample No.:	HT-1	HT-2
Date Sampled:	4-7-88	4-7-88
Time Sampled:	14:20	14:22
Date Analyzed:	4-15-88	4-15-88

Compound	Detection Limits ug/kg	Analytical Results ug/kg	ug/kg
Acetone	100	ND	ND
Acrolein	10	ND	ND
Acrylonitrile	10	ND	ND
2-Butanone (MEK)	100	ND	ND
Carbon Disulfide	10	ND	ND
Dibromomethane	10	ND	ND
1,4-Dichloro-2-butene	10	ND	ND
Dichlorodifluoromethane	10	ND	ND
Ethyl methacrylate	10	ND	ND
2-Hexanone	50	ND	ND
Iodomethane	10	ND	ND
4-Methyl-2-pentanone	50	ND	ND
1,2,3-Trichloropropane	10	ND	ND
Vinyl acetate	50	ND	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988 P.O. No.: .....
Date Reported: April 18, 1988 Job No. : NC065.01

For: ES:Berkeley/Peterson/Emeryville ATTN: Mr. Dan McCullar
Address: 600 Bancroft Way
Berkeley, California 94710

Lab Number:	880736	880737
Sample No.:	HT-1	HT-2
Date Sampled:	4-7-88	4-7-88
Time Sampled:	14:20	14:22
Date Analyzed:	4-15-88	4-15-88

Compound	Analytical Results ug/kg	ug/kg
Additional Compounds Requested:*		
Cyclohexane	5	10
Methylcyclopentane	7	110
2,3-Dimethylbutane	ND	53
3-Methylpentane	6	280
2-Methylpentane	6	10
Hexane	3	36

Analyst

Laboratory Supervisor

*These are estimated concentrations as per CLP protocol.

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING SCIENCE

Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988
Date Reported: April 18, 1988

P.O. No.: .....
Job No. : NC065.01

For: ES:Berkeley/Peterson/Emeryville
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880738
Sample No.:	HT-3
Date Sampled:	4-7-88
Time Sampled:	14:24
Date Analyzed:	4-15-88

Compound	Detection Limit ug/kg	Analytical Results ug/kg
Chloromethane	50	ND
Bromomethane	50	ND
Vinyl Chloride	50	ND
Chloroethane	50	ND
Dichloromethane	25	ND
Trichlorofluoromethane	50	ND
1,1-Dichloroethene	25	ND
1,1-Dichloroethane	25	ND
trans-1,2-Dichloroethene	25	ND
Chloroform	25	ND
1,2-Dichloroethane	25	ND
1,1,1-Trichloroethane	25	ND
Carbon Tetrachloride	25	ND
Bromodichloromethane	25	ND
1,2-Dichloropropane	25	ND
trans-1,3-Dichloropropene	25	ND
Trichloroethene	25	ND
Benzene	25	ND
Dibromochloromethane	25	ND
1,1,2-Trichloroethane	25	ND
cis-1,3-Dichloropropene	25	ND
2-Chloroethyl vinyl ether	50	ND
Bromoform	25	ND
1,1,2,2-Tetrachloroethane	25	ND
Tetrachloroethene	25	ND
Toluene	25	ND
Chlorobenzene	25	ND
Ethylbenzene	25	ND
Styrene	25	ND
Total Xylenes	25	112

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988
Date Reported: April 18, 1988

P.O. No.:.....
Job No.: NC065.01

For: ES:Berkeley/Peterson/Emeryville
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880738
Sample No.:	HT-3
Date Sampled:	4-7-88
Time Sampled:	14:24
Date Analyzed:	4-15-88

Compound	Detection Limits ug/kg	Analytical Results ug/kg
Acetone	500	ND
Acrolein	50	ND
Acrylonitrile	50	ND
2-Butanone (MEK)	500	ND
Carbon Disulfide	50	ND
Dibromomethane	50	ND
1,4-Dichloro-2-butene	50	ND
Dichlorodifluoromethane	50	ND
Ethyl methacrylate	50	ND
2-Hexanone	250	ND
Iodomethane	50	ND
4-Methyl-2-pentanone	250	ND
1,2,3-Trichloropropane	50	ND
Vinyl acetate	250	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988 P.O. No.: .....
Date Reported: April 18, 1988 Job No. : NC065.01

For: ES:Berkeley/Peterson/Emeryville ATTN: Mr. Dan McCullar
Address: 600 Bancroft Way
Berkeley, California 94710

Lab Number:	880738
Sample No.:	HT-3
Date Sampled:	4-7-88
Time Sampled:	14:24
Date Analyzed:	4-15-88

Compound	Analytical Results ug/kg
Additional Compounds Requested:*	
Cyclohexane	88
Methylcyclopentane	400
2,3-dimethylbutane	270
3-Methylpentane	630
2-Methylpentane	220
Hexane	440

Analyst

Laboratory Supervisor

*These are estimated concentrations as per CLP protocol.

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988
Date Reported: April 18, 1988

P.O. No.: .....
Job No. : NC065.01

For: ES:Berkeley/Peterson/Emeryville
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880736	880737
Sample No.:	HT-1	HT-2
Date Sampled:	4-7-88	4-7-88
Time Sampled:	14:20	14:22
Date Analyzed:	4-15-88	4-15-88

Compound	Detection Limit ug/kg	Analytical Results ug/kg	ug/kg
Chloromethane	10	ND	ND
Bromomethane	10	ND	ND
Vinyl Chloride	10	ND	ND
Chloroethane	10	ND	ND
Dichloromethane	5	ND	ND
Trichlorofluoromethane	10	ND	ND
1,1-Dichloroethene	5	ND	ND
1,1-Dichloroethane	5	ND	ND
trans-1,2-Dichloroethene	5	ND	ND
Chloroform	5	ND	ND
1,2-Dichloroethane	5	ND	ND
1,1,1-Trichloroethane	5	ND	ND
Carbon Tetrachloride	5	ND	ND
Bromodichloromethane	5	ND	ND
1,2-Dichloropropane	5	ND	ND
trans-1,3-Dichloropropene	5	ND	ND
Trichloroethene	5	ND	ND
Benzene	5	ND	ND
Dibromochloromethane	5	ND	ND
1,1,2-Trichloroethane	5	ND	ND
cis-1,3-Dichloropropene	5	ND	ND
2-Chloroethyl vinyl ether	10	ND	ND
Bromoform	5	ND	ND
1,1,2,2-Tetrachloroethane	5	ND	ND
Tetrachloroethene	5	ND	ND
Toluene	5	ND	ND
Chlorobenzene	5	ND	ND
Ethylbenzene	5	ND	ND
Styrene	5	ND	ND
Total Xylenes	5	ND	6

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988 P.O. No.: .....
Date Reported: April 18, 1988 Job No.: NC065.01

For: ES:Berkeley/Peterson/Emeryville ATTN: Mr. Dan McCullar
Address: 600 Bancroft Way
Berkeley, California 94710

Lab Number:	880736	880737
Sample No.:	HT-1	HT-2
Date Sampled:	4-7-88	4-7-88
Time Sampled:	14:20	14:22
Date Analyzed:	4-15-88	4-15-88

Compound	Detection Limits ug/kg	Analytical Results ug/kg	ug/kg
Acetone	100	ND	ND
Acrolein	10	ND	ND
Acrylonitrile	10	ND	ND
2-Butanone (MEK)	100	ND	ND
Carbon Disulfide	10	ND	ND
Dibromomethane	10	ND	ND
1,4-Dichloro-2-butene	10	ND	ND
Dichlorodifluoromethane	10	ND	ND
Ethyl methacrylate	10	ND	ND
2-Hexanone	50	ND	ND
Iodomethane	10	ND	ND
4-Methyl-2-pentanone	50	ND	ND
1,2,3-Trichloropropane	10	ND	ND
Vinyl acetate	50	ND	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988 P.O. No.: .....
Date Reported: April 18, 1988 Job No. : NC065.01

For: ES:Berkeley/Peterson/Emeryville ATTN: Mr. Dan McCullar
Address: 600 Bancroft Way
Berkeley, California 94710

Lab Number:	880736	880737
Sample No.:	HT-1	HT-2
Date Sampled:	4-7-88	4-7-88
Time Sampled:	14:20	14:22
Date Analyzed:	4-15-88	4-15-88

Compound	Analytical Results ug/kg	ug/kg
Additional Compounds Requested:*		
Cyclohexane	5	10
Methylcyclopentane	7	110
2,3-Dimethylbutane	ND	53
3-Methylpentane	6	280
2-Methylpentane	6	10
Hexane	3	36

Analyst

Laboratory Supervisor

*These are estimated concentrations as per CLP protocol.

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988
Date Reported: April 18, 1988

P.O. No.: .....
Job No. : NC065.01

For: ES:Berkeley/Peterson/Emeryville
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880738
Sample No.:	HT-3
Date Sampled:	4-7-88
Time Sampled:	14:24
Date Analyzed:	4-15-88

Compound	Detection Limit ug/kg	Analytical Results ug/kg
Chloromethane	50	ND
Bromomethane	50	ND
Vinyl Chloride	50	ND
Chloroethane	50	ND
Dichloromethane	25	ND
Trichlorofluoromethane	50	ND
1,1-Dichloroethene	25	ND
1,1-Dichloroethane	25	ND
trans-1,2-Dichloroethene	25	ND
Chloroform	25	ND
1,2-Dichloroethane	25	ND
1,1,1-Trichloroethane	25	ND
Carbon Tetrachloride	25	ND
Bromodichloromethane	25	ND
1,2-Dichloropropane	25	ND
trans-1,3-Dichloropropene	25	ND
Trichloroethene	25	ND
Benzene	25	ND
Dibromochloromethane	25	ND
1,1,2-Trichloroethane	25	ND
cis-1,3-Dichloropropene	25	ND
2-Chloroethyl vinyl ether	50	ND
Bromoform	25	ND
1,1,2,2-Tetrachloroethane	25	ND
Tetrachloroethene	25	ND
Toluene	25	ND
Chlorobenzene	25	ND
Ethylbenzene	25	ND
Styrene	25	ND
Total Xylenes	25	112

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988
Date Reported: April 18, 1988

P.O. No.:.....
Job No.: NC065.01

For: ES:Berkeley/Peterson/Emeryville
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCuller

Lab Number:	880738
Sample No.:	HT-3
Date Sampled:	4-7-88
Time Sampled:	14:24
Date Analyzed:	4-15-88

Compound	Detection Limits ug/kg	Analytical Results ug/kg
Acetone	500	ND
Acrolein	50	ND
Acrylonitrile	50	ND
2-Butanone (MEK)	500	ND
Carbon Disulfide	50	ND
Dibromomethane	50	ND
1,4-Dichloro-2-butene	50	ND
Dichlorodifluoromethane	50	ND
Ethyl methacrylate	50	ND
2-Hexanone	250	ND
Iodomethane	50	ND
4-Methyl-2-pentanone	250	ND
1,2,3-Trichloropropane	50	ND
Vinyl acetate	250	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 7, 1988 P.O. No.: .....
Date Reported: April 18, 1988 Job No. : NC065.01

For: ES:Berkeley/Peterson/Emeryville ATTN: Mr. Dan McCullar
Address: 600 Bancroft Way
Berkeley, California 94710

Lab Number:	880738
Sample No.:	HT-3
Date Sampled:	4-7-88
Time Sampled:	14:24
Date Analyzed:	4-15-88

Compound	Analytical Results ug/kg
Additional Compounds Requested:*	
Cyclohexane	88
Methylcyclopentane	400
2,3-dimethylbutane	270
3-Methylpentane	630
2-Methylpentane	220
Hexane	440

Analyst

Laboratory Supervisor

*These are estimated concentrations as per CLP protocol.

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING SCIENCE INC.
04/11/88

ANALYSIS REPORT

WORK ORDER NUMBER: 574
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 04/07/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 3, UNITS: ug/L

	SC-S1	SC-S2	SP-SA1	SP-SA2	SP-SB1	SP-SB2
TEST COMPOUND	88040720	88040721	88040723	88040724	88040726	88040727
413.2 TOTAL OIL AND GREASE-IR		6,900		47		60
418.1 PETROLEUM HYDROCARBONS	5,700		34		10	

ANALYSIS REPORT FOR WORK ORDER NUMBER 574

TASK: 4, UNITS: ug/G, GROUP PCB

TEST COMPOUND	WW1-1 88040729
PCB-1016	ND
PCB-1221	ND
PCB-1232	ND
PCB-1242	ND
PCB-1248	ND
PCB-1254	59
PCB-1260	ND

TASK:4, UNITS:ug/ml, GROUP GCFID

TEST COMPOUND	WW1-1 88040730
Diesel #2	250,000
Unleaded Gasoline	780,000

Note: There is an error in the calculation of unleaded gasoline because Diesel #2 partially interferes.

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - EPA 624 + Hexanes
Matrix: Water

Date Received: April 7, 1988
Date Reported: April 8, 1988
P.O. No.: .....
Job No. : NC065

For: ES:Berkeley/Wareham-Peterson
Attn: Mr. Dan McCullar
Address: 600 Bancroft Way
Berkeley, California 94710

Lab Number:	880722	880725
Sample No.:	SC-S3	SP-SA3
Date Sampled:	4-7-88	4-7-88
Time Sampled:	1000	1035
Date Analyzed:	4-7-88	4-8-88

Compound	Detection Limit ug/L	Analytical Results ug/L	ug/L
Chloromethane	10	ND	ND
Bromomethane	10	ND	ND
Vinyl Chloride	10	ND	ND
Chloroethane	10	ND	ND
Dichloromethane	3	ND	ND
Trichlorofluoromethane	10	ND	ND
1,1-Dichloroethene	3	ND	ND
1,1-Dichloroethane	5	ND	ND
trans-1,2-Dichloroethene	2	ND	ND
Chloroform	2	ND	ND
1,2-Dichloroethane	3	ND	ND
1,1,1-Trichloroethane	4	ND	ND
Carbon Tetrachloride	3	ND	ND
Bromodichloromethane	2	ND	ND
1,2-Dichloropropane	5	ND	ND
trans-1,3-Dichloropropene	5	ND	ND
Trichloroethene	2	ND	ND
Benzene	4	ND	ND
Dibromochloromethane	3	ND	ND
1,1,2-Trichloroethane	5	ND	ND
cis-1,3-Dichloropropene	10	ND	ND
2-Chloroethyl vinyl ether	10	ND	ND
Bromoform	5	ND	ND
1,1,2,2-Tetrachloroethane	7	ND	ND
Tetrachloroethene	4	ND	ND
Toluene	6	23	21
Chlorobenzene	6	ND	ND
Ethylbenzene	7	ND	ND
1,2-Dichlorobenzene	10	ND	ND
1,3- & 1,4-Dichlorobenzene	10	ND	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - EPA 624 + Hexanes
Matrix: Water

Date Received: April 7, 1988
Date Reported: April 8, 1988

P.O. No.: .....
Job No. : NC065

For: ES:Berkeley/Wareham-Peterson
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880722	880725
Sample No:	SC-S3	SP-SA3
Date Sampled:	4-7-88	4-7-88
Time Sampled:	1000	1035
Date Analyzed:	4-7-88	4-8-88

Compound	Analytical Results	
	ug/L	ug/L
Additional Compounds Requested:*		
Cyclohexane	ND	30
Methylcyclopentane	ND	110
3-Methylpentane	ND	29
2-Methylpentane	ND	12
Hexane	ND	69

Analyst

Laboratory Supervisor

*These are estimated concentrations as per CLP protocal

NOTE: These samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING SCIENCE INC.
04/05/88

ANALYSIS REPORT

WORK ORDER NUMBER: 567
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 04/01/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
KATHERINE CHESICK

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : KATHERINE CHESICK
(415)-548-7970

TASK: 3, UNITS: NA

TEST COMPOUND	TF-4 4/1/88 88040675
418.1 PETROLEUM HYDROCARBONS	HOLD

ANALYSIS REPORT FOR WORK ORDER NUMBER 567

TASK: 3, UNITS: mg/KG

TEST COMPOUND	TF-3 4/1/88 88040674	TF-2 4/1/88 88040676	TF-5 4/1/88 88040677
418.1 PETROLEUM HYDROCARBONS	7900	150000	5200

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 1, 1988
Date Reported: April 5, 1988

P.O. No.: .....
Job No. : NC065

For: ES Berkeley/Peterson Emeryville
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880677
Sample No.:	TF-5
Date Sampled:	4-1-88
Time Sampled:	Not Supplied
Date Analyzed:	4-4-88

Compound	Detection Limit ug/kg	Analytical Results ug/kg
Chloromethane	580	ND
Bromomethane	580	ND
Vinyl Chloride	580	ND
Chloroethane	580	ND
Dichloromethane	290	ND
Trichlorofluoromethane	580	ND
1,1-Dichloroethene	290	ND
1,1-Dichloroethane	290	ND
trans-1,2-Dichloroethene	290	ND
Chloroform	290	ND
1,2-Dichloroethane	290	ND
1,1,1-Trichloroethane	290	ND
Carbon Tetrachloride	290	ND
Bromodichloromethane	290	ND
1,2-Dichloropropane	290	ND
trans-1,3-Dichloropropene	290	ND
Trichloroethene	290	ND
Benzene	290	ND
Dibromochloromethane	290	ND
1,1,2-Trichloroethane	290	ND
cis-1,3-Dichloropropene	290	ND
2-Chloroethyl vinyl ether	580	ND
Bromoform	290	ND
1,1,2,2-Tetrachloroethane	290	ND
Tetrachloroethene	290	ND
Toluene	290	ND
Chlorobenzene	290	ND
Ethylbenzene	290	ND
Styrene	290	ND
Total Xylenes	290	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 1, 1988
Date Reported: April 5, 1988

P.O. No.:.....
Job No.: NC065

For: ES Berkeley/Peterson Emeryville
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880677
Sample No.:	TF-5
Date Sampled:	4-1-88
Time Sampled:	Not Supplied
Date Analyzed:	4-4-88

Compound	Detection Limits ug/kg	Analytical Results ug/kg
Acetone	5800	ND
Acrolein	580	ND
Acrylonitrile	580	ND
2-Butanone (MEK)	5800	ND
Carbon Disulfide	580	ND
Dibromomethane	580	ND
1,4-Dichloro-2-butene	580	ND
Dichlorodifluoromethane	580	ND
Ethyl methacrylate	580	ND
2-Hexanone	2900	ND
Iodomethane	580	ND
4-Methyl-2-pentanone	2900	ND
1,2,3-Trichloropropane	580	ND
Vinyl acetate	2900	ND

Analyst

Laboratory Supervisor

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 1, 1988
Date Reported: April 5, 1988

P.O. No.: .....
Job No. : NC065

For: ES Berkeley/Peterson Emeryville
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880674	880676
Sample No.:	TF-3	TF-2
Date Sampled:	4-1-88	4-1-88
Time Sampled:	Not Supplied	Not Supplied
Date Analyzed:	4-4-88	4-4-88

Compound	Detection Limit ug/kg	Analytical Results ug/kg	ug/kg
Chloromethane	580	ND	ND
Bromomethane	580	ND	ND
Vinyl Chloride	580	ND	ND
Chloroethane	580	ND	ND
Dichloromethane	290	ND	ND
Trichlorofluoromethane	580	ND	ND
1,1-Dichloroethene	290	ND	ND
1,1-Dichloroethane	290	ND	ND
trans-1,2-Dichloroethene	290	ND	ND
Chloroform	290	ND	2800
1,2-Dichloroethane	290	ND	ND
1,1,1-Trichloroethane	290	ND	ND
Carbon Tetrachloride	290	ND	ND
Bromodichloromethane	290	ND	ND
1,2-Dichloropropane	290	ND	ND
trans-1,3-Dichloropropene	290	ND	ND
Trichloroethene	290	ND	ND
Benzene	290	ND	ND
Dibromochloromethane	290	ND	ND
1,1,2-Trichloroethane	290	ND	ND
cis-1,3-Dichloropropene	290	ND	ND
2-Chloroethyl vinyl ether	580	ND	ND
Bromoform	290	ND	ND
1,1,2,2-Tetrachloroethane	290	ND	ND
Tetrachloroethene	290	ND	ND
Toluene	290	ND	ND
Chlorobenzene	290	ND	ND
Ethylbenzene	290	ND	ND
Styrene	290	ND	ND
Total Xylenes	290	ND	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: April 1, 1988
Date Reported: April 5, 1988

P.O. No.: .....
Job No.: NC065

For: ES Berkeley/Peterson Emeryville
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Mr. Dan McCullar

Lab Number:	880674	880676
Sample No.:	TF-3	TF-2
Date Sampled:	4-1-88	4-1-88
Time Sampled:	Not Supplied	Not Supplied
Date Analyzed:	4-4-88	4-4-88

Compound	Detection Limits ug/kg	Analytical Results ug/kg	ug/kg
Acetone	5800	ND	14000
Acrolein	580	ND	ND
Acrylonitrile	580	ND	ND
2-Butanone (MEK)	5800	ND	ND
Carbon Disulfide	580	ND	ND
Dibromomethane	580	ND	ND
1,4-Dichloro-2-butene	580	ND	ND
Dichlorodifluoromethane	580	ND	ND
Ethyl methacrylate	580	ND	ND
2-Hexanone	2900	ND	ND
Iodomethane	580	ND	ND
4-Methyl-2-pentanone	2900	ND	ND
1,2,3-Trichloropropane	580	ND	ND
Vinyl acetate	2900	ND	ND

Analyst

Laboratory Supervisor

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

CHAIN OF CUSTODY RECORD

BC Log Number _____

Client name: Engineering Science	Project or PO#: NC065.10
Address: 600 Bancroft Way	Phone #: 548-7970
City, State, Zip: Berkeley, CA	Report attention: Dan McCullar

Sampled by: Marcus L. Pierce

Lab Sample number	Date sampled	Time sampled	Type* See key below	Sample description	Number of containers	Analyses required: petroHC fuel HC	Analyses required: 624	Analyses required: O&G 503A	Analyses required: grav. metric	Hazardous sample / Special handling required	Remarks
	3/24/88	14:45	AQ	TF-S Tank Farm Sump	2		X				1 extra VOA vial
	"	16:20	AQ	TF-4 Tank Farm #4	5	X	X	X			1 extra VOA vial for 624 2 liters for O&G, 1 liter for Fuel HC
											24 hrs for 624
											~~48 hrs for Fuel HC~~
											& O&G 48hr
											1 week for petroHC

	Signature	Print Name	Company	Date	Time
Relinquished by	Marcus L. Pierce	Marcus L. Pierce	E.S.	3/24/88	17:00
Received by	Barbara Danielsen	Barbara Danielsen	B&C	3/24/88	17:00
Relinquished by					
Received by					
Relinquished by					
Received by Laboratory					

BROWN AND CALDWELL LABORATORIES

- ☐ 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300
- ☐ 373 South Fair Oaks Avenue, Pasadena, CA 91105 (818) 795-7553
- ☐ 1200 Pacifico Avenue, Anaheim, CA 92805

Note:
Samples are discarded 30 days after results are reported unless other arrangements are made.
Hazardous samples will be returned to client or disposed of at client expense.

*KEY: AQ—Aqueous NA—Nonaqueous SL—Sludge GW—Groundwater SO—Soil OT—Other PE—Petroleum

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-03-603

Received: 24 MAR 88
Reported: 30 MAR 88

Mr. Dan McCullar
Engineering Science
600 Bancroft Way
Berkeley, California 94710

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
03-603-1	TF-4	24 MAR 88
03-603-2	TF-S	24 MAR 88

PARAMETER	03-603-1	03-603-2
Hydrocarbons by IR, mg/L	12	---
Oil and Grease, mg/L	38	---

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-03-603

Received: 24 MAR 88
Reported: 30 MAR 88

Mr. Dan McCullar
Engineering Science
600 Bancroft Way
Berkeley, California 94710

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
03-603-1	TF-4	24 MAR 88
03-603-2	TF-S	24 MAR 88

PARAMETER	03-603-1	03-603-2
Purgeable Priority Pollutants		
Date Extracted	03.25.88	03.25.88
1,1,1-Trichloroethane, ug/L	<10	<10
1,1,2,2-Tetrachloroethane, ug/L	<10	<10
1,1,2-Trichloroethane, ug/L	<10	<10
1,1-Dichloroethane, ug/L	<10	<10
1,1-Dichloroethylene, ug/L	<10	<10
1,2-Dichloroethane, ug/L	<10	<10
1,2-Dichloropropane, ug/L	<10	<10
1,3-Dichloropropene, ug/L	<10	<10
2-Chloroethylvinylether, ug/L	<10	<10
Acrolein, ug/L	<100	<100
Acrylonitrile, ug/L	<100	<100
Bromodichloromethane, ug/L	<10	<10
Bromomethane, ug/L	<10	<10
Benzene, ug/L	<10	<10
Chlorobenzene, ug/L	<10	<10
Carbon Tetrachloride, ug/L	<10	<10
Chloroethane, ug/L	<10	<10
Bromoform, ug/L	<10	<10
Chloroform, ug/L	<10	<10
Chloromethane, ug/L	<10	<10
Dibromochloromethane, ug/L	<10	<10
Ethylbenzene, ug/L	<10	<10
Methylene chloride, ug/L	<10	<10
Tetrachloroethylene, ug/L	<10	<10

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-03-603

Received: 24 MAR 88
Reported: 30 MAR 88

Mr. Dan McCullar
Engineering Science
600 Bancroft Way
Berkeley, California 94710

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
03-603-1	TF-4	24 MAR 88
03-603-2	TF-S	24 MAR 88

PARAMETER	03-603-1	03-603-2
Trichloroethylene, ug/L	<10	<10
Trichlorofluoromethane, ug/L	<10	<10
Toluene, ug/L	<10	1100
Vinyl chloride, ug/L	<10	<10
trans-1,2-Dichloroethylene, ug/L	<10	<10
trans-1,3-Dichloropropene, ug/L	<10	<10

Linda Brackpk
Steve Fisher, Laboratory Director

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	DB McCullar	NC065

PROJECT NAME / LOCATION: WAREHAM-PETERSON, EMERYVILLE, CA

SAMPLER(S): (SIGNATURE) DB McCullar

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: 418.1	413.2	624	608 (PCBs)			PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
SC-S1	4/7	10:00	Aq.	Small Concrete Sump	2	✓						✓		All Rush (24 hr if possible)
SC-S2	4/7	10:00	"	"	2		✓					✓		
SC-S3	4/7	10:00	"	"	2			✓				✓		verbal report by Friday PM
SP-Sa1	4/7	10:35	"	Solvent Plant Sump (south)	2	✓						✓		
SP-Sa2	4/7	10:35	"	"	2		✓					✓		
SP-Sa3	4/7	10:35	"	"	2			✓				✓		
SP-Sb1	4/7	10:30	"	Solvent Plant Sump (north)	2	✓						✓		
SP-Sb2	4/7	10:30	"	"	2		✓					✓		
SP-Sb3	4/7	10:30	"	"	2			✓				✓		
WW1-1	4/7	9:25	"	WATER WELL	2				✓			✓		
WW1-2	4/7	9:25	"	"	2			✓				✓		Changed to GC/FID

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
DB McCullar	4/7/88 11:39				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Kathe C. Kida	4-7-88 11:39	Rec'd cold + intact

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ENGINEERING SCIENCE INC.
04/11/88

ANALYSIS REPORT

WORK ORDER NUMBER: 574
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 04/07/88

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
DAN McCULLAR

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : DAN McCULLAR
(415)-548-7970

TASK: 3, UNITS: mg/L

	SC-S1	SC-S2	SP-SA1	SP-SA2	SP-SB1	SP-SB2
TEST COMPOUND	88040720	88040721	88040723	88040724	88040726	88040727
413.2 TOTAL OIL AND GREASE-IR		6,900		47		60
418.1 PETROLEUM HYDROCARBONS	5,700		34		10	

DRAFT

ANALYSIS REPORT FOR WORK ORDER NUMBER 574

TASK: 4, UNITS: ug/L, GROUP PCB

TEST COMPOUND	WW1-1 88040729
PCB-1016	ND
PCB-1221	ND
PCB-1232	ND
PCB-1242	ND
PCB-1248	ND
PCB-1254	59
PCB-1260	ND

TASK:4, UNITS:ug/ml, GROUP GCFID

TEST COMPOUND	WW1-1 88040730
Diesel #2	250,000
Unleaded Gasoline	780,000

Note: There is an error in the calculation of unleaded gasoline because Diesel #2 partially interferes.

DRAFT

ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01 Invoice # 502
Client: ES Berkeley
Attention: Dan McCullar
Copy: Rick Makdisi
Project: Peterson Manufacturing

Attached are the analytical reports for the water samples received by this laboratory on 4-07-88.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
88040720	418.1	4-07-88	10:00	4-07-88	4-08-88	
88040721	413.2	4-07-88	10:00	4-07-88	4-07-88	
88040723	418.1	4-07-88	10:35	4-07-88	4-08-88	
88040724	413.2	4-07-88	10:35	4-07-88	4-07-88	
88040726	418.1	4-07-88	10:30	4-07-88	4-08-88	
88040727	413.2	4-07-88	10:30	4-07-88	4-07-88	
88040729	PCB	4-07-88	9:25	4-07-88	4-08-88	
88040730	GCFID	4-07-88	9:25	4-07-88	4-08-88	

* If applicable

Detection Limits
Environmental Quality Parameters
Samples No.: 88040720 - 88040729

Parameter	Units	Detection Limits
413.2		
Total Oil & Grease - IR	mg/L	5
418.1		
Petroleum Hydrocarbons	mg/L	5
GCFID		
Diesel #2	ug/mL	500
Unleaded Gasoline	ug/mL	1000

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
PCBs
EPA 608/8080
Sample No.: 88040729

Compound	Detection Limits
PCB-1016	0.25 ug/G
PCB-1221	0.25 ug/G
PCB-1232	0.25 ug/G
PCB-1242	0.25 ug/G
PCB-1248	0.25 ug/G
PCB-1254	0.50 ug/G
PCB-1260	0.50 ug/G

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

CHAIN OF CUSTODY RECORD

BC Log Number _____

Client name	Project or PO#
Marcus L. Pierce	NC065.10
Address	**Phone #**
600 Bancroft Way	548-7970
City, State, Zip	**Report attention**
Berkeley CA	Katherine Chesick

Analyses required: Oil & Grease; [illegible]; pH; [illegible]; Hazardous sample / Special handling required

Lab Sample number	Date sampled	Time sampled	Type* See key below	Sampled by / Sample description	Number of containers	Oil & Grease	[illegible]	pH	[illegible]	Hazardous sample / Special handling required	Remarks
	3/22/88	14:35		OV Trough 3.5'	2	X		X	X		~~Hold~~ Rush on Oil & Grease
	11	15:15		OV Trough Bottom	2	X		X	X		Hold on other analyses until confirmed over phone

	Signature	Print Name	Company	Date	Time
Relinquished by	Marcus L. Pierce				
Received by		~~B+C~~	B&C	3/22/88	1551
Relinquished by					
Received by					
Relinquished by					
Received by Laboratory					

BROWN AND CALDWELL LABORATORIES

- ☐ 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300
- ☐ 373 South Fair Oaks Avenue, Pasadena, CA 91105 (818) 795-7553
- ☐ 1200 Pacifico Avenue, Anaheim, CA 92805

Note:
Samples are discarded 30 days after results are reported unless other arrangements are made.
Hazardous samples will be returned to client or disposed of at client expense.

*KEY: AQ—Aqueous NA—Nonaqueous SL—Sludge GW—Groundwater SO—Soil OT—Other PE—Petroleum

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-03-548

Received: 22 MAR 88
Reported: 24 MAR 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065.10

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
03-548-1	OV Trough 3.5'	22 MAR 88
03-548-2	OV Trough Bottom	22 MAR 88

PARAMETER	03-548-1	03-548-2
pH, Units	7.0	7.0
Oil and Grease, mg/L	<5	<5

Linda Brackon
Steve Fisher, Laboratory Director

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	K. Chesick	NC065.13

PROJECT NAME / LOCATION:
Peterson Manufacturing
1600 63rd Street, Emeryville

SAMPLER(S): (SIGNATURE)
M. Pierce, K. Chesick

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: pH	Oil and Grease (503A)	COD (508C), using 934 Air Filter	Total Suspended Solids	PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME	REMARKS
Peterson IV	3/16/88	16:00	Liquid	Vat in Main Plant Building	2	✓	✓	✓	✓	No		24 hrs	Samples may have significant amount of animal fat
Peterson OV	3/16/88	16:30	Liquid	Trough end of Building	2	✓	✓	✓	✓	No		24 hrs	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Katherine Chesick	3/16/88 15:11				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Fernando Contreras	3/16/88 19:11	Please do Oil + Grease analysis by Standard Method 503 A. Please do COD analysis by Method 508 C.

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BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-03-438

Received: 16 MAR 88
Reported: 17 MAR 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065.13

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, LIQUID SAMPLES	DATE SAMPLED
03-438-1	Peterson IV Vat	16 MAR 88
03-438-2	Peterson OV Trough	16 MAR 88

PARAMETER	03-438-1	03-438-2	
Filtered COD, mg/L	50	1800	
pH, Units	7.4	6.8	
Non-filterable Residue (TSS), mg/L	34	1000	
Oil and Grease, mg/L	9	570	

Linda Black Fisher

Steve Fisher, Laboratory Director

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-03-438

Received: 16 MAR 88
Reported: 17 MAR 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065.13

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, LIQUID SAMPLES	DATE SAMPLED
03-438-1	Peterson IV Vat	16 MAR 88
03-438-2	Peterson OV Trough	16 MAR 88

PARAMETER	03-438-1	03-438-2
Filtered COD, mg/L	50	1800
pH, Units	7.4	6.8
Non-filterable Residue (TSS), mg/L	34	1000
Oil and Grease, mg/L	9	570

Steve Fisher, Laboratory Director

ENGINEERING-SCIENCE, INC.

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	K. Chesick	NC065.13

PROJECT NAME / LOCATION: Peterson Property 1600 63rd Street Emeryville

SAMPLER(S): (SIGNATURE) Marcus L. Pierce Marcus L. Pierce

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: 413.2 Oil + Grease	418.1 TPH	8240 + Estimated Hydrocarbons	% Moisture	PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME	REMARKS
TF-1	3/1/88	14:30	Soil	Tank Farm + Outside Sumps	3	✓	✓	✓	✓			By Fri 3/4	90% fat
TF-7	3/1/88	16:00	Soil	" " " "	3	✓	✓	✓	✓			"	
TF-6	3/1/88	15:30	Soil	" " " "	3	✓	✓					"	"Iron oxide flakes"
TF-W	3/1/88	16:30	Water	" " " "	3	✓	✓	✓				"	Water + grease? (analyze water fraction)
TF-S	3/1/88	17:00	Water	" " " "	3	✓	✓	✓				"	

Sample pulled 3/2/88

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Marcus L. Pierce	3/1/88 18:45				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Bill Friedman	3/1/88 18:45	rec'd cold & intact

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ES
ENGINEERING-SCIENCE, INC.

RESEARCH AND DEVELOPMENT
LABORATORY
600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 841-7353

Job No.: NC065.01 Invoice # 383

Client: ES Berkeley

Attention: Katherine Chesick

Copy: Rick Makdisi

Project: Peterson Manufacturing

Attached are the analytical reports for the sample(s) received by this laboratory on 3-2-88.

SAMPLE PREPARATION DATA

Laboratory Sample No.	Test	Date Collected	Time Collected	Date* Extracted	Date Analyzed	Date* 2nd Col.
88030509	413.2	3-1-88	14:30	3-2-88	3-3-88	
88030509	418.1	3-1-88	14:30	3-2-88	3-3-88	
88030509	Moisture	3-1-88	14:30		3-3-88	
88030510	413.2	3-1-88	16:00	3-2-88	3-3-88	
88030510	418.1	3-1-88	16:00	3-2-88	3-3-88	
88030510	Moisture	3-1-88	16:00		3-3-88	
88030511	413.2	3-1-88	16:30	3-2-88	3-3-88	
88030511	418.1	3-1-88	16:30	3-2-88	3-3-88	
88030512	413.2	3-1-88	17:00	3-2-88	3-3-88	
88030512	418.1	3-1-88	17:00	3-2-88	3-3-88	

*If applicable

Detection Limits
Environmental Quality Parameters
Sample Nos.: 88030509-88030510

Parameter	Units	Detection Limits
413.2 Oil and Grease - IR	mg/KG	100
418.1 Petroleum Hydrocarbons	mg/KG	100
Moisture	%	1

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
Environmental Quality Parameters
Sample Nos.: 88030511-88030512

Parameter	Units	Detection Limits
413.2 Oil and Grease - IR	mg/L	1
418.1 Petroleum Hydrocarbons	mg/L	1

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING SCIENCE INC.
03/04/88

ANALYSIS REPORT

ORK ORDER NUMBER: 521
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 03/02/88

APPROVED BY _____
Lab Supervisor

EPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
00 BANCROFT WAY
ERKELEY, CA 94710
KATHERINE CHESICK

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
ONTACT : KATHERINE CHESICK
(415)-548-7970

ASK: 3, UNITS: mg/Kg

EST COMPOUND	TF-1 3/1/88 88030509	TF-7 3/1/88 88030510
413.2 TOTAL OIL AND GREASE-IR	330000	43000
18.1 PETROLEUM HYDROCARBONS	12000	1900
MOISTURE	14.6	78.0

ANALYSIS REPORT FOR WORK ORDER NUMBER 521

TASK: 3, UNITS: mg/L

TEST COMPOUND	TF-W 3/1/88 88030511	TF-S 3/1/88 88030512
413.2 TOTAL OIL AND GREASE-IR	14	4200
418.1 PETROLEUM HYDROCARBONS	4.8	86

ENGINEERING SCIENCE

Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Water

Date Received: March 1, 1988
Date Reported: March 3, 1988

P.O. No.: .....
Job No. : NC065.13

For: ES:Berkeley/Peterson Property
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Ms. K. Chesick

Lab Number:	880511	880512
Sample No.:	TF-W	TF-S
Date Sampled:	3-1-88	3-1-88
Time Sampled:	1630	1700
Date Analyzed:	3-2-88	3-2-88

Compound	Detection Limit ug/L	Analytical Results ug/L	ug/L
Chloromethane	100	ND	ND
Bromomethane	100	ND	ND
Vinyl Chloride	100	ND	ND
Chloroethane	100	ND	ND
Dichloromethane	50	ND	ND
Trichlorofluoromethane	100	ND	ND
1,1-Dichloroethene	50	ND	ND
1,1-Dichloroethane	50	ND	ND
trans-1,2-Dichloroethene	50	ND	ND
Chloroform	50	ND	ND
1,2-Dichloroethane	50	ND	ND
1,1,1-Trichloroethane	50	ND	ND
Carbon Tetrachloride	50	ND	ND
Bromodichloromethane	50	ND	ND
1,2-Dichloropropane	50	ND	ND
trans-1,3-Dichloropropene	50	ND	ND
Trichloroethene	50	ND	ND
Benzene	50	ND	ND
Dibromochloromethane	50	ND	ND
1,1,2-Trichloroethane	50	ND	ND
cis-1,3-Dichloropropene	50	ND	ND
2-Chloroethyl vinyl ether	100	ND	ND
Bromoform	50	ND	ND
1,1,2,2-Tetrachloroethane	50	ND	ND
Tetrachloroethene	50	ND	ND
Toluene	50	ND	1400
Chlorobenzene	50	ND	ND
Ethylbenzene	50	ND	ND
Styrene	50	ND	ND
Total Xylenes	50	ND	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Water

Date Received: March 1, 1988
Date Reported: March 3, 1988

P.O. No.: .....
Job No.: NC065.13

For: ES:Berkeley/Peterson Property
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Ms. K. Chesick

Lab Number:	880511	880512
Sample No.:	TF-W	TF-S
Date Sampled:	3-1-88	3-1-88
Time Sampled:	1630	1700
Date Analyzed:	3-2-88	3-2-88

Compound	Detection Limits ug/L	Analytical Results ug/L	ug/L
Acetone	1000	ND	ND
Acrolein	100	ND	ND
Acrylonitrile	100	ND	ND
2-Butanone (MEK)	1000	ND	ND
Carbon Disulfide	100	ND	ND
Dibromomethane	100	ND	ND
1,4-Dichloro-2-butene	100	ND	ND
Dichlorodifluoromethane	100	ND	ND
Ethyl methacrylate	100	ND	ND
2-Hexanone	500	ND	ND
Iodomethane	100	ND	ND
4-Methyl-2-pentanone	500	ND	ND
1,2,3-Trichloropropane	100	ND	ND
Vinyl acetate	500	ND	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Water

Date Received: March 1, 1988 P.O. No.: .....
Date Reported: March 3, 1988 Job No.: NC065.13

For: ES:Berkeley/Peterson Property ATTN: Ms. K. Chesick
Address: 600 Bancroft Way
Berkeley, California 94710

Lab Number:	880511	880512
Sample No.:	TF-W	TF-S
Date Sampled:	3-1-88	3-1-88
Time Sampled:	1630	1700
Date Analyzed:	3-2-88	3-2-88

Compound	Retention Time (min.)	Analytical Results ug/L (Estimated)	ug/L
Tentatively Identified Compounds:			
C6 Hydrocarbon	16.90	83	ND

Analyst

Laboratory Supervisor

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: March 1, 1988
Date Reported: March 3, 1988

P.O. No.: .....
Job No. : NC065.13

For: ES:Berkeley/Peterson Property
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Ms. K. Chesick

Lab Number:	880509	880510
Sample No.:	TF-1	TF-7
Date Sampled:	3-1-88	3-1-88
Time Sampled:	1430	1600
Date Analyzed:	3-2-88	3-2-88

Compound	Detection Limit ug/kg	Analytical Results ug/kg	ug/kg
Chloromethane	1300	ND	ND
Bromomethane	1300	ND	ND
Vinyl Chloride	1300	ND	ND
Chloroethane	1300	ND	ND
Dichloromethane	640	ND	ND
Trichlorofluoromethane	1300	ND	ND
1,1-Dichloroethene	640	ND	ND
1,1-Dichloroethane	640	ND	ND
trans-1,2-Dichloroethene	640	ND	ND
Chloroform	640	3600	ND
1,2-Dichloroethane	640	ND	ND
1,1,1-Trichloroethane	640	ND	ND
Carbon Tetrachloride	640	ND	ND
Bromodichloromethane	640	ND	ND
1,2-Dichloropropane	640	ND	ND
trans-1,3-Dichloropropene	640	ND	ND
Trichloroethene	640	ND	ND
Benzene	640	ND	ND
Dibromochloromethane	640	ND	ND
1,1,2-Trichloroethane	640	ND	ND
cis-1,3-Dichloropropene	640	ND	ND
2-Chloroethyl vinyl ether	1300	ND	ND
Bromoform	640	ND	ND
1,1,2,2-Tetrachloroethane	640	ND	ND
Tetrachloroethene	640	ND	ND
Toluene	640	ND	2600
Chlorobenzene	640	ND	ND
Ethylbenzene	640	ND	ND
Styrene	640	ND	ND
Total Xylenes	640	ND	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: March 1, 1988
Date Reported: March 3, 1988

P.O. No.: .....
Job No.: NC065.13

For: ES:Berkeley/Peterson Property
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Ms. K. Chesick

Lab Number:	880509	880510
Sample No.:	TF-1	TF-7
Date Sampled:	3-1-88	3-1-88
Time Sampled:	1430	1600
Date Analyzed:	3-2-88	3-2-88

Compound	Detection Limits ug/kg	Analytical Results ug/kg	ug/kg
Acetone	13,000	ND	ND
Acrolein	1300	ND	ND
Acrylonitrile	1300	ND	ND
2-Butanone (MEK)	13,000	ND	ND
Carbon Disulfide	1300	ND	ND
Dibromomethane	1300	ND	ND
1,4-Dichloro-2-butene	1300	ND	ND
Dichlorodifluoromethane	1300	ND	ND
Ethyl methacrylate	1300	ND	ND
2-Hexanone	6400	ND	ND
Iodomethane	1300	ND	ND
4-Methyl-2-pentanone	6400	ND	ND
1,2,3-Trichloropropane	1300	ND	ND
Vinyl acetate	6400	ND	ND

ENGINEERING SCIENCE
Priority Pollutant Analysis
Volatile Organics - Method 8240
Matrix: Soil

Date Received: March 1, 1988
Date Reported: March 3, 1988

P.O. No.: .....
Job No.: NC065.13

For: ES:Berkeley/Peterson Property
Address: 600 Bancroft Way
Berkeley, California 94710

ATTN: Ms. K. Chesick

Lab Number:	880509	880510
Sample Number:	TF-1	TF-7
Date Sampled:	3-1-88	3-1-88
Time Sampled:	1430	1600
Date Analyzed:	3-2-88	3-2-88

Compound	Retention Time (min.)	Analytical Results ug/kg	ug/kg (Estimated)
Tentatively Identified Compounds:			
C6 Hydrocarbon	16.78	530	ND
C6 or C7 Hydrocarbon	18.43	560	ND
C6 or C7 Hydrocarbon	21.87	1900	ND
C6 Hydrocarbon	26.38	1500	ND
C7 Hydrocarbon	33.00	1500	ND

Analyst

Laboratory Supervisor

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

[redacted] ENGINEERING-SCIENCE, INC.

CHAIN OF CUSTODY RECORD

PAGE [redacted] OF [redacted]

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Dan McCullar	NC065.

PROJECT NAME / LOCATION: Wareham Peterson

SAMPLER(S): (SIGNATURE) Dan McCullar, Eric N. Stowers

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: TPH (GC/FID)	EPA 608 (PCB's)	EPA 624				PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME	REMARKS
UST4-WS	5/5/88	12:15/12:40	water	UST4 pit	4	✓	✓	✓							
UST1-WO	5/5/88	16:30	water	UST1 pit	1	[redacted]	✓								cannot run GC/FID on oil, will run 608 on 24hr rush

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
[redacted]	5/5/88 8:55	Stephen L. Green	5/5/88 4:58	Delivered to Curtis and Tompkins, Ltd

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Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LAB NUMBER: 14654
CLIENT: ENGINEERING SCIENCE
PROJECT #: NC065
LOCATION: WAREHAM PETERSON

DATE RECEIVED: 05-06-88
DATE ANALYZED: 05-20-88
DATE REPORTED: 05-25-88

Results of Analysis for Petroleum Hydrocarbons in Water

Method References: TPH: Total Petroleum Hydrocarbons, EPA 3510/8015

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER * (mg/L)
14654-1	UST4-WS	ND(0.05)	ND(0.05)	ND(0.05)	2.7

ND = Not Detected; Limit of detection in parentheses.

* Fingerprint pattern does not match Hydrocarbon Standard. Quantitation based on area sum of peaks within (C14-C20) boiling range.

QA/QC SUMMARY

Duplicate: Relative % Difference	10
Spike: % Recovery	107

LABORATORY DIRECTOR

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 14654-1
CLIENT: ENGINEERING-SCIENCE
SAMPLE ID: UST4-W5
PROJECT NO.: NC065

DATE RECEIVED: 05/27/88
DATE ANALYZED: 05/16/88
DATE REPORTED: 05/27/88

EPA METHOD 624: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Detection Limit ug/L
benzene	ND	5
carbon tetrachloride	ND	5
chlorobenzene	ND	5
1,2-dichloroethane	ND	5
1,1,1-trichloroethane	ND	5
1,1-dichloroethane	ND	5
1,1,2-trichloroethane	ND	5
1,1,2,2-tetrachloroethane	ND	5
chloroethane	ND	5
2-chloroethylvinyl ether	ND	10
chloroform	ND	5
1,1-dichloroethene	ND	5
1,2-trans-dichloroethene	ND	5
1,2-dichloropropane	ND	5
1,3-dichloropropene	ND	5
ethylbenzene	ND	5
methylene chloride	ND	10
chloromethane	ND	5
bromomethane	ND	5
bromoform	ND	5
bromodichloromethane	ND	5
fluorotrichloromethane	ND	5
chlorodibromomethane	ND	5
tetrachloroethene	ND	5
toluene	ND	5
trichloroethene	ND	5
vinyl chloride	ND	5
Non-Priority Hazardous Pollutant Substances List Compounds		
acetone	ND	10
2-butanone	ND	10
carbon disulfide	ND	5
2-hexanone	ND	5
4-methyl-2-pentanone	ND	5
styrene	ND	5
vinyl acetate	ND	5
total xylenes	ND	5

QA/QC:	Surrogate Spike Recovery %
1,2 Dichloroethane-d4	114
Toluene-d8	99
Bromofluorobenzene	105

Curtis & Tompkins, Ltd

LAB NUMBER: 14654
CLIENT: ENGINEERING SCIENCE
PROJECT #: NC065
LOCATION: WAREHAM PETERSON
REPORT ON: EXTRACTED OIL FROM 2 WATER SAMPLES

DATE RECEIVED: 05-06-88
DATE ANALYZED: 05-09-88
DATE REPORTED: 05-25-88

==========

POLYCHLORINATED BIPHENYLS (PCB'S)
METHOD: EPA 8080
EXTRACTION METHOD: EPA 3580-WASTE DILUTION

==========

LAB ID	CLIENT ID	AROCLOR	CONCENTRATION (mg/Kg)	MDL (mg/Kg)
14654-1	UST4-WS	PCB 1016	ND	1.0
		PCB 1221	ND	1.0
		PCB 1232	ND	1.0
		PCB 1242	ND	1.0
		PCB 1248	ND	1.0
		PCB 1254	2.0	1.0
		PCB 1260	ND	1.0
14654-2	UST1-WO	PCB 1016	ND	1.0
		PCB 1221	ND	1.0
		PCB 1232	ND	1.0
		PCB 1242	ND	1.0
		PCB 1248	ND	1.0
		PCB 1254	ND	1.0
		PCB 1260	ND	1.0

ND = NONE DETECTED; LIMIT OF DETECTION IS INDICATED IN LAST COLUMN.

QA/QC SUMMARY

%RPD	3
%RECOVERY	90

ENGINEERING SCIENCE, INC.

CHAIN OF CUSTODY RECORD

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Katherine Chesick	NC065

PROJECT NAME / LOCATION: Peterson Manufact. Co / 1600 65th Street

SAMPLER(S): (SIGNATURE) K. Chesick / K. Chesick

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: PCBs (by method 8080)	ANALYSES REQUIRED: GC/FID (Please identify all peaks)	ANALYSES REQUIRED: 624	PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME	REMARKS
MW-3	1/13/88	12:58	water	Well MW-3	2	✓					2 weeks	
MW-3	1/13/88	13:05	water	Well MW-3	2		✓				"	
MW-3	1/13/88	13:20	water	Well MW-3	2			✓	✓ 1:1 HCl		"	Note: if preserved samples collected at 13:25 may be used; these were not preserved.
MW-3	1/13/88	13:25	water	Well MW-3	2						"	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Katherine Chesick	13:42 1/13/88				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		D. Kenoly	1/13/88 13:42	For GC/FID, please identify all compounds. Suggest Diesel/waste oil standard

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BROWN AND CALDWELL LABORATORIES

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ANALYTICAL REPORT

LOG NO: E88-01-230

Received: 13 JAN 88
Reported: 01 FEB 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
01-230-1	MW-3	13 JAN 88

PARAMETER	01-230-1
Polychlorinated Biphenyls	
Date Extracted	01.14.88
Date Analyzed	01.15.88
Aroclor 1016, ug/L	<0.3
Aroclor 1221, ug/L	<0.3
Aroclor 1232, ug/L	<0.3
Aroclor 1242, ug/L	<0.3
Aroclor 1248, ug/L	<0.3
Aroclor 1254, ug/L	<0.3
Aroclor 1260, ug/L	<0.3
Aroclor 1262, ug/L	<0.3
Other Polychlorinated Biphenyls	---
Total Fuel Hydrocarbons, mg/L	2.7

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-01-230

Received: 13 JAN 88
Reported: 01 FEB 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
01-230-1	MW-3	13 JAN 88

PARAMETER	01-230-1
Purgeable Priority Pollutants	
Date Extracted	01.27.88
1,1,1-Trichloroethane, ug/L	<1
1,1,2,2-Tetrachloroethane, ug/L	<1
1,1,2-Trichloroethane, ug/L	<1
1,1-Dichloroethane, ug/L	<1
1,1-Dichloroethylene, ug/L	<1
1,2-Dichloroethane, ug/L	<1
1,2-Dichloropropane, ug/L	<1
1,3-Dichloropropene, ug/L	<1
2-Chloroethylvinylether, ug/L	<1
Acrolein, ug/L	<10
Acrylonitrile, ug/L	<10
Bromodichloromethane, ug/L	<1
Bromomethane, ug/L	<1
Benzene, ug/L	<1
Chlorobenzene, ug/L	<1
Carbon Tetrachloride, ug/L	<1
Chloroethane, ug/L	<1
Bromoform, ug/L	<1
Chloroform, ug/L	<1
Chloromethane, ug/L	<1
Dibromochloromethane, ug/L	<1
Ethylbenzene, ug/L	<1
Methylene chloride, ug/L	<1
Tetrachloroethylene, ug/L	2
Trichloroethylene, ug/L	<1

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-01-230

Received: 13 JAN 88
Reported: 01 FEB 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
01-230-1	MW-3	13 JAN 88

PARAMETER	01-230-1
Trichlorofluoromethane, ug/L	<1
Toluene, ug/L	<1
Vinyl chloride, ug/L	<1
trans-1,2-Dichloroethylene, ug/L	<1
trans-1,3-Dichloropropene, ug/L	<1
Semi-Quantified Results **	
C6H12 Hydrocarbon, ug/L	40
C7H14 Hydrocarbon, ug/L	100
C8H16 Hydrocarbon, ug/L	30
C9H18 Hydrocarbon, ug/L	20

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

Steve Fisher, Laboratory Director

ENGINEERING – SCIENCE, INC.
CHAIN OF CUSTODY RECORD

CLIENT: ENGINEERING–SCIENCE, INC. BERKELEY

PROJECT MANAGER: Katherine Chesick

PROJ. NO.: NC065.

PROJECT NAME / LOCATION: Peterson Manufacturing Co, 63rd St. Emeryville

SAMPLER(S): (SIGNATURE) K. Chesick K. Chesick

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: GC/FID (8015) use diesel/waste oil	standard. identify all compounds !!	PCB's (8080)	8240 (GC/MS)			PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME	REMARKS
MW-3 4.5'	1/6/88	11:58	Soil	Peterson Site / Hexane Tank	1	X		X	X					2 weeks	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Katherine Chesick	1/6/88 17:16				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		B. Kelly	1/6/88 1715	Please identify all compounds in GC/FID analysis

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-01-091

Received: 06 JAN 88
Reported: 21 JAN 88

REVISED 1/26/88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
01-091-1	MW3 4.5'	06 JAN 88

PARAMETER	01-091-1
Polychlorinated Biphenyls	
Date Extracted	01.07.88
Date Analyzed	01.08.88
Aroclor 1016, mg/kg	<0.3
Aroclor 1221, mg/kg	<0.3
Aroclor 1232, mg/kg	<0.3
Aroclor 1242, mg/kg	<0.3
Aroclor 1248, mg/kg	<0.3
Aroclor 1254, mg/kg	<0.3
Aroclor 1260, mg/kg	<0.3
Aroclor 1262, mg/kg	<0.3
Other Polychlorinated Biphenyls	---
Total Fuel Hydrocarbons, mg/kg	1100

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-01-091

Received: 06 JAN 88
Reported: 21 JAN 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
01-091-1	MW3 4.5'	06 JAN 88

PARAMETER	01-091-1
Purgeable Priority Pollutants	
Extraction	01.07.88
1,1,1-Trichloroethane, mg/kg	<0.2
1,1,2,2-Tetrachloroethane, mg/kg	<0.2
1,1,2-Trichloroethane, mg/kg	<0.2
1,1-Dichloroethane, mg/kg	<0.2
1,1-Dichloroethylene, mg/kg	<0.2
1,2-Dichloroethane, mg/kg	<0.2
1,2-Dichloropropane, mg/kg	<0.2
1,3-Dichloropropene, mg/kg	<0.2
2-Chloroethylvinylether, mg/kg	<0.2
Acrolein, mg/kg	<2
Acrylonitrile, mg/kg	<2
Bromodichloromethane, mg/kg	<0.2
Bromomethane, mg/kg	<0.2
Benzene, mg/kg	<0.2
Chlorobenzene, mg/kg	<0.2
Carbon Tetrachloride, mg/kg	<0.2
Chloroethane, mg/kg	<0.2
Bromoform, mg/kg	<0.2
Chloroform, mg/kg	<0.2
Chloromethane, mg/kg	<0.2
Dibromochloromethane, mg/kg	<0.2
Ethylbenzene, mg/kg	<0.2
Methylene chloride, mg/kg	<0.2
Tetrachloroethylene, mg/kg	<0.2
Trichloroethylene, mg/kg	<0.2

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-01-091

Received: 06 JAN 88
Reported: 21 JAN 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
01-091-1	MW3 4.5'	06 JAN 88

PARAMETER	01-091-1
Trichlorofluoromethane, mg/kg	<0.2
Toluene, mg/kg	0.6
Vinyl chloride, mg/kg	<0.2
trans-1,2-Dichloroethylene, mg/kg	<0.2
trans-1,3-Dichloropropene, mg/kg	<0.2
Semi-Quantified Results **	
C7H14 Hydrocarbon, mg/kg	2
C8H16, mg/kg	1
C9H18 Hydrocarbon, mg/kg	4

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

The sample was identified as Diesel Fuel by the Total Fuel Hydrocarbon analysis.

Steve Fisher, Laboratory Director

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-01-091

Received: 06 JAN 88
Reported: 21 JAN 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
01-091-1	MW3 4.5'	06 JAN 88

PARAMETER	01-091-1
Polychlorinated Biphenyls	
Date Extracted	01.07.88
Date Analyzed	01.08.88
Aroclor 1016, mg/kg	<0.3
Aroclor 1221, mg/kg	<0.3
Aroclor 1232, mg/kg	<0.3
Aroclor 1242, mg/kg	<0.3
Aroclor 1248, mg/kg	<0.3
Aroclor 1254, mg/kg	<0.3
Aroclor 1260, mg/kg	<0.3
Aroclor 1262, mg/kg	<0.3
Other Polychlorinated Biphenyls	---
Total Fuel Hydrocarbons, mg/kg	1100

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-01-091

Received: 06 JAN 88
Reported: 21 JAN 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
01-091-1	MW3 4.5'	06 JAN 88

PARAMETER	01-091-1
Purgeable Priority Pollutants	
Extraction	01.07.88
1,1,1-Trichloroethane, mg/kg	<0.2
1,1,2,2-Tetrachloroethane, mg/kg	<0.2
1,1,2-Trichloroethane, mg/kg	<0.2
1,1-Dichloroethane, mg/kg	<0.2
1,1-Dichloroethylene, mg/kg	<0.2
1,2-Dichloroethane, mg/kg	<0.2
1,2-Dichloropropane, mg/kg	<0.2
1,3-Dichloropropene, mg/kg	<0.2
2-Chloroethylvinylether, mg/kg	<0.2
Acrolein, mg/kg	<2
Acrylonitrile, mg/kg	<2
Bromodichloromethane, mg/kg	<0.2
Bromomethane, mg/kg	<0.2
Benzene, mg/kg	<0.2
Chlorobenzene, mg/kg	<0.2
Carbon Tetrachloride, mg/kg	<0.2
Chloroethane, mg/kg	<0.2
Bromoform, mg/kg	<0.2
Chloroform, mg/kg	<0.2
Chloromethane, mg/kg	<0.2
Dibromochloromethane, mg/kg	<0.2
Ethylbenzene, mg/kg	<0.2
Methylene chloride, mg/kg	<0.2
Tetrachloroethylene, mg/kg	<0.2
Trichloroethylene, mg/kg	<0.2

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E88-01-091

Received: 06 JAN 88
Reported: 21 JAN 88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
01-091-1	MW3 4.5'	06 JAN 88

PARAMETER	01-091-1
Trichlorofluoromethane, mg/kg	<0.2
Toluene, mg/kg	0.6
Vinyl chloride, mg/kg	<0.2
trans-1,2-Dichloroethylene, mg/kg	<0.2
trans-1,3-Dichloropropene, mg/kg	<0.2
Semi-Quantified Results **	
C7H14 Hydrocarbon, mg/kg	2
C8H16, mg/kg	1
C9H18 Hydrocarbon, mg/kg	4

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

Steve Fisher, Laboratory Director

ENGINEERING – SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING–SCIENCE, INC. BERKELEY	Katherine Chesick	NC065.09

PROJECT NAME / LOCATION: Graham Peterson 63rd St, Emeryville

SAMPLER(S): (SIGNATURE) K. Chesick [illegible]

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	Oil + Grease by Stand. Meth 503 A + E	Fuel hydrocarbons (EC/FID) Please identify all compounds				PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME	REMARKS
MW25	11/6/87	9:38	Soi[illegible]	West of Main Plant	1	X	X						2 weeks	Want note, clients
														wish to know kind
														of compound.
														Oil & Grease and Petrock

RELINQUISHED BY: (SIGNATURE)	DATE/TIME		RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Katherine Chesick	11/6/87	4:07	[illegible]			

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS

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BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-11-218

Received: 06 NOV 87
Reported: 16 DEC 87

REVISED 1/26/88

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065.09

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
11-218-1	MW2 5'	06 NOV 87

PARAMETER	11-218-1
Gravimetric O&G/Hydrocarbons	
Oil and Grease, mg/kg	<250
Oil and Grease, Hydrocarbons, mg/kg	<250
Total Fuel Hydrocarbons, mg/kg	<10

Linda Brackom
Steve Fisher, Laboratory Director

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-11-218
Received: 06 NOV 87
Reported: 16 DEC 87

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065.09

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
11-218-1	MW-25'	06 NOV 87

PARAMETER	11-218-1
Gravimetric O&G/Hydrocarbons	
Oil and Grease, mg/kg	<250
Oil and Grease, Hydrocarbons, mg/kg	<250
Total Fuel Hydrocarbons, mg/kg	<10

Linda Brackfox
Steve Fisher, Laboratory Director

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Katherine Chesick	NC065.09

PROJECT NAME / LOCATION: Warham Peterson, 63rd St, Emeryville

SAMPLER(S): (SIGNATURE) K. Chesick K. Chesick

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	[illegible, crossed out]	Tetraethyl lead	EDB	Fuel hydrocarbons (gasoline) Please identify all components	+ BTX	PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME	REMARKS
MW-1.5	11/5/87	11:39	Soil	Fuel island	1		X	X	X	X			2 weeks	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Katherine Chesick	11/5/87 5:34				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		[signature]	11/5/87 5:34	

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BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-11-182

Received: 05 NOV 87
Reported: 08 DEC 87

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

REVISED 12/6/88

Project: NC065.09

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
11-182-1	MW1 5'	05 NOV 87

PARAMETER	11-182-1
Lead, mg/kg	4.9
Nitric Acid Digestion, Date	11.20.87
Ethylene Dibromide, ug/kg	<1
Benzene,Toluene,Xylene Isomers	
Benzene, mg/kg	0.7
Toluene, mg/kg	0.8
Total Xylene Isomers, mg/kg	1.2
Total Fuel Hydrocarbons, mg/kg	360

The sample was identified as a mixture of Gasoline and Diesel Fuel by the Total Fuel Hydrocarbbon analysis.

Linda Brackfon
Steve Fisher, Laboratory Director

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-11-182

Received: 05 NOV 87
Reported: 08 DEC 87

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065.09

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
11-182-1	MW-1.5	05 NOV 87

PARAMETER	11-182-1
Lead, mg/kg	4.9
Nitric Acid Digestion, Date	11.20.87
Ethylene Dibromide, ug/kg	<1
Benzene,Toluene,Xylene Isomers	
Benzene, mg/kg	0.7
Toluene, mg/kg	0.8
Total Xylene Isomers, mg/kg	1.2
Total Fuel Hydrocarbons, mg/kg	360

Linda Brack Fox
D. A. McLean, Laboratory Director

ENGINEERING – SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Katherine Chesick	NC065.09

PROJECT NAME / LOCATION: Wareham Peterson 63rd St. Emeryville

SAMPLER(S): (SIGNATURE) K. Chesick K. Chesick

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: Total Fuel Hydrocarbons (GC/FID) Please identify all compounds	Standard Method 503A and 503E	Tetraethyl Lead	Total Fuel Hydrocarbons (GC/FID) Identify all compounds + BTX	PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME	REMARKS
MW-2	11/12/87	4:17	Water	West side of Main Plant	3	X	X					2 weeks	
MW-1	11/12/87	5:05	Water	Fuel Island	4			X	X	X		2 weeks	
												3 weeks	
													Please identify all compounds on the GC/FID Total Fuel Hydrocarb. Analyses

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Katherine Chesick	11/12/87 5:19	[illegible]			

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS

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BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-11-384

Received: 12 NOV 87
Reported: 15 DEC 87

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065.09

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
11-384-2	MW-1	12 NOV 87

PARAMETER	11-384-2
Lead, mg/L	0.031
Nitric Acid Digestion, Date	11.18.87
Ethylene Dibromide, ug/L	<0.02
Benzene,Toluene,Xylene Isomers	
Benzene, mg/L	1.7
Toluene, mg/L	2.6
Total Xylene Isomers, mg/L	4.2
Total Fuel Hydrocarbons, mg/L	21

Total Fuel Hydrocarbons for MW-1 is primarily Gas.

Steve Fisher, Laboratory Director

BROWN AND CALDWELL LABORATORIES

1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-11-384

Received: 12 NOV 87
Reported: 15 DEC 87

Ms. Katherine Chesick
Engineering Science
600 Bancroft Way
Berkeley, California 94710

Project: NC065.09

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
11-384-1	MW-2	12 NOV 87

PARAMETER	11-384-1
Gravimetric O&G/Hydrocarbons	
Oil and Grease, mg/L	200
Oil and Grease, Hydrocarbons, mg/L	<5
Total Fuel Hydrocarbons, mg/L	<1.0

ENGINEERING – SCIENCE, INC.
CHAIN OF CUSTODY RECORD

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING–SCIENCE, INC. BERKELEY	Katherine Chesick	NC065.01

PROJECT NAME / LOCATION: Wareham Peterson Manufacturing Co.

SAMPLER(S): (SIGNATURE) K. Chesick K. Chesick

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: EC/FID Total Petrol. Hydrocarbons Scan	ANALYSES REQUIRED: TCBs (8080)	ANALYSES REQUIRED: Tetraethyl lead	ANALYSES REQUIRED	ANALYSES REQUIRED	ANALYSES REQUIRED	PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME	REMARKS
T 1	9/18/87	9:15	Sludge + water	Tank 1, 63rd St. Emeryville, CA	3	✓	✓							1 week	Water w/ oily sludge & boiler fuel #6
T 2	9/18/87	10:15	Product (liquid)	Tank 2, 63rd St. Emeryville, CA	3	✓		✓						1 week	Prob. diesel #2
T 3B	9/18/87	10:40	Product (liquid)	Tank 3B 63rd St. Emeryville, CA	3	✓		✓						1 week	Diesel or gas??
T 4	9/18/87	11:15	Oil (liquid)	Tank 4, 63rd St. Emeryville, CA	3	✓	✓							1 week	Oily boiler fuel → may contain animal fat in high amts. → May be boiler fuel #2 or #6

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Katherine Chesick	9/18/87 11:55				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		Debbie Fisher	9/18/87 11:55	

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TMA
Thermo Analytical Inc.

TMA/Norcal
1400 53rd Street
Suite 460
Emeryville, CA 94608-2946
(415) 652-2300

September 30, 1987

Engineering Science
600 Bancroft Way
Berkeley, CA 94710

TMA/Norcal Project: 2226-41

Subject: Analytical Testing Performed on four (4) Sets of Samples "NC065.01" (Wareham Peterson Manufacturing Co.) received on 9/18/87.

Dear Ms. Chesick:

Analytical testing of the samples referenced above is complete.

The samples were analyzed to measure the concentrations of various organic and inorganic constituents. The analytical method used for hydrocarbon scan is EPA method 8015 modified, in accordance with "Guidelines for Addressing Fuel Leaks" (CRWQCB-S.F. Bay Region). Aroclor analysis was performed by method "The Analysis of PCB's in Transformer Oil." Tetraethyl Lead was performed by ASTM method (D1949) 24.

Results are presented in Tables 1 through 3. If you have any questions, please contact us.

Submitted by:

Christina Anderson-Hoke

Christina Anderson-Hoke
Chemist

Approved by:

Cary B. Jackson

Cary B. Jackson
Organics Department Manager

CAH:CBJ:ltm

Table I
Aroclor's in Oil

TMA/Norcal	Client ID	Aroclor Conentration (mg/kg)
2226-41-2	T-1	85 as 1221
2226-41-11	T-4	<1
Method Detection limit* Oil (mg/kg)		1

* Estimated values based on sample matrix.

Table II
Tetraethyl Lead

TMA/Norcal	Client ID	Tetraethyl Lead (mg/L)
2226-41-5	T-2	Ø.3
2226-41-8	T-3b	<Ø.2
Method Detection Limit* Water (mg/L)		Ø.2

* Estimated values based on sample matrix

Table III
Total Hydrocarbon Scan
(EPA Method 8015 modified)

TMA/Norcal	Client ID	Total Hydrocarbons Scan (mg/L)
2226-41-1	T-1	46 as C5 - C12
2226-41-4	T-2	750 as C9 - C22
2226-41-7	T-3b	1,000,000 as C9 - C22*
2226-41-10	T-4	210,000 as C9 - C22**
Method Detection Limit*** Water (mg/L)		0.05

* 1,000,000 mg/L = 100%. Sample contained diesel and hydrocarbons with lower molecular weights within this category.

** 210,000 mg/L = 21%. Sample contained diesel and hydrocarbons with higher molecular weights within this category.

*** Estimated values based on sample matrix.

ENGINEERING – SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING–SCIENCE, INC. BERKELEY	Katherine Chesick	

PROJECT NAME / LOCATION: Wareham / Peterson Manufacturing Co.

SAMPLER(S): (SIGNATURE) K. Chesick Katherine Chesick

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	418.1	413.2	GC/FID Total Petroleum Hydrocarbons	PCB's (8080)			PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
BH10-2.5	9/9/87	11:45	Soil	Peterson Manufacturing Co. 63rd St Emeryville	1	✓	✓						A	873235
BH9A-5.5	9/9/87	12:36	Soil	" "	1			✓	✓				B	2 w/ GC/FID please distinguish gasoline, diesel fuel, Bunker oil
BH9A-10	9/9/87	13:00	Soil	" "	1			✓	✓				B	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Katherine Chesick	9/9/87 15:03				
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS	
		Kathe C. Kaiser	9/9/87 15:05	A – single sample B – composite 1 week turnaround or 2 days EZ	

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ES
ENGINEERING-SCIENCE, INC.

600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 548-7970

Revised Report 10/12/87

Job No.: NC065.01 Invoice # 29

Client: ES Berkeley

Attention: Katherine Chesick

Copy: Rick Makdisi

Project: Wareham/Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 9/9/87.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
87093235	413.2	9-9-87	11:45	9-11-87	9-14-87	
87093235	418.1	9-9-87	11:45	9-11-87	9-14-87	
87093236	GCFID	9-9-87	12:36-13:00	9-11-87	9-15-87	
87093236	PCBs	9-9-87	12:36-13:00	9-10-87	9-14-87	

Characterizations:
87093236 = #2 Diesel

* If applicable

Detection Limits
Environmental Quality Parameters
Sample No.: 87093235

Parameter	Units	Detection Limits
413.2 Total Oil and Grease-IR	mg/KG	100
418.1 Petroleum Hydrocarbons	mg/KG	100

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
PCBs
EPA 608/8080
Sample No.: 87093236

Compound	Detection Limits
PCB-1016	50 ug/KG
PCB-1221	50 ug/KG
PCB-1232	50 ug/KG
PCB-1243	50 ug/KG
PCB-1248	50 ug/KG
PCB-1254	50 ug/KG
PCB-1260	50 ug/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
FID Scan
Samples No.: 87093236

Compound	Detection Limits
Petroleum Hydrocarbons	10 mg/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

156.37.2

ANALYSIS REPORT

ORK ORDER NUMBER: 47
OB NUMBER : ZB0000000360
WORK ORDER DATE : 09/21/87

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
ATHERINE CHESICK

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : KATHERINE CHESICK
(415)-548-7970

TASK: 3, UNITS: mg/KG

TEST COMPOUND	RH10-2.5 87093235
413.2 TOTAL OIL AND GREASE-IR	<100
418.1 PETROLEUM HYDROCARBONS	<100

ND: Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 47

TASK: 4, UNITS: mg/KG, GROUP GCFID

TEST COMPOUND	BH9A-5.5 & 10.0 COMPOSITE 87093236
GC PETROLEUM HYDROCARBONS	16

ND = Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 47

TASK: 4, UNITS: ug/KG, GROUP PCB

TEST COMPOUND	BH9-5.5 & 10.0 COMPOSITE 87093256
PCB-1016	ND
PCB-1221	ND
PCB-1232	ND
PCB-1242	ND
PCB-1248	ND
PCB-1254	ND
PCB-1260	ND

ND - Not Detected

ES
ENGINEERING-SCIENCE, INC.

600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 548-7970

Rec revised report 9/21/87

Job No.: 56449.06
Client: ES Berkeley
Attention: Katherine Chesick
Copy: Rick Makdisi

Project: Wareham/Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 9/9/87.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
87093235	413.2	9-9-87	11:45	9-11-87	9-14-87	
87093235	418.1	9-9-87	11:45	9-11-87	9-14-87	
87093236	GCFID	Results to follow				
87093236	PCBs	9-9-87	12:36-13:00	9-10-87	9-14-87	

* If applicable

Detection Limits
Environmental Quality Parameters
Sample No.: 87093235

Parameter	Units	Detection Limits
413.2 Petroleum Hydrocarbons	mg/KG	100
418.1 Petroleum Hydrocarbons	mg/KG	100

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
PCBs
EPA 608/8080
Sample No.: 87093236

Compound	Detection Limits
PCB-1016	50 ug/KG
PCB-1221	50 ug/KG
PCB-1232	50 ug/KG
PCB-1243	50 ug/KG
PCB-1248	50 ug/KG
PCB-1254	50 ug/KG
PCB-1260	50 ug/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING-SCIENCE INC.
09/15/87

ANALYSIS REPORT

ORK ORDER NUMBER: 47
OB NUMBER : ZB0000000278
WORK ORDER DATE : 09/09/87

APPROVED BY _____
Lab Supervisor

EPORT DATA:
ES BERKELEY/WAREHAM
600 BANCROFT WAY
ERKELEY, CA 94710
ICK MAKDISI

CLIENT DATA:
ES BERKELEY/WAREHAM (27)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : 56449.06
CONTACT : RICK MAKDISI
(415)-548-7970

TASK: 3, UNITS: mg/KG

EST	COMPOUND	BH10-2.5 87093235
413.2	PETROLEUM HYDROCARBONS	<100
418.1	PETROLEUM HYDROCARBONS	<100

D - Not Delected

ANALYSIS REPORT FOR WORK ORDER NUMBER 47

TASK: 4, UNITS: ug/KG, GROUP PCB

TEST COMPOUND	BH9A-5.5 & 10.0 COMPOSITE 87093236
PCB-1016	ND
PCB-1221	ND
PCB-1232	ND
PCB-1242	ND
PCB-1248	ND
PCB-1254	ND
PCB-1260	ND

ND - Not Detected

ENGINEERING – SCIENCE, INC.
CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

CLIENT: ENGINEERING-SCIENCE, INC. BERKELEY

PROJECT MANAGER: Katherine Chesick

PROJ. NO.:

PROJECT NAME / LOCATION: Wareham / Peterson Manufacturing, Emeryville

SAMPLER(S): (SIGNATURE) K. Chesick / K. Chesick

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: GC/FID Total Petroleum Hydrocarbons	PCB's (EPA 8080)	418.1	413.2	PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
BH7-3.5	9/8/87	14:19	Soil	Peterson Manufacturing 63rd St.	1	✓	✓				A	→ GC/FID – Please distinguish among gasoline, boiler fuel, diesel, & heavier than boiler fuel
BH7-9.5	9/8/87	14:33	Soil	"	1	✓	✓				A	
BH8-2.5	9/8/87	15:01	Soil	"	1		✓	✓	✓		B	
BH8-6.0	9/8/87	15:05	Soil	"	1		✓	✓	✓		B	
BH8-9.0	9/8/87	15:21	Soil	"	1		✓	✓	✓		B	
BH3-1.0	9/8/87	15:35	Soil	"	1			✓	✓		C	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Katherine Chesick	9/8/87 17:28				

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME
		J. Hunter	9/8/87 17:28

REMARKS
A – Composite
B – Composite
C – Composite

1 week Turnaround

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Detection Limits
Environmental Quality Parameters
Samples No.: 87093223 and 87093224

Parameter	Units	Detection Limits
413.2 Total Oil and Grease-IR	mg/KG	100
418.1 Petroleum Hydrocarbons	mg/KG	100

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ES
ENGINEERING-SCIENCE, INC.

600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 548-7970

Revised Report 10/12/87

Job No.: NC065.01 invoice # 26

Client: ES Berkeley

Attention: Katherine Chesick

Copy: Rick Makdisi

Project: Wareham/Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 9/8/87.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
87093222	GCFID	9-8-87	14:19-14:33	9-11-87	9-15-87	
87093222	PCBs	9-8-87	14:19-14:33	9-10-87	9-11-87	
87093223	PCBs	9-8-87	15:01-15:21	9-10-87	9-11-87	
87093223	413.2	9-8-87	15:01-15:21	9-10-87	9-14-87	
87093223	418.1	9-8-87	15:01-15:21	9-10-87	9-14-87	
87093224	413.2	9-8-87	15:35	9-10-87	9-14-87	
87093224	418.1	9-8-87	15:35	9-10-87	9-14-87	

Characterizations:
87093222 = #2 Diesel

* If applicable

Detection Limits
FID Scan
Samples No.: 87093222

Compound	Detection Limits
Petroleum Hydrocarbons	10 mg/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
PCBs
EPA 608/8080
Samples No.: 87093222 and 87093223

Compound	Detection Limits
PCB-1016	50 ug/KG
PCB-1221	50 ug/KG
PCB-1232	50 ug/KG
PCB-1243	50 ug/KG
PCB-1248	50 ug/KG
PCB-1254	50 ug/KG
PCB-1260	50 ug/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ANALYSIS REPORT

WORK ORDER NUMBER : 41
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 09/21/87

APPROVED BY Kathl C. Kidd for RB
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC065.01
CONTACT : KATHERINE CHESICK
(415)-548-7970

TASK: 3, UNITS: mg/KG

TEST COMPOUND	BH8-2.5, & 6.0, & 9.0 COMPOSITE 87093223	BH3-1.0 COMPOSITE 87093224
413.2 TOTAL OIL AND GREASE-IR	<100	100
418.1 PETROLEUM HYDROCARBONS	<100	<100

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 41

TASK: 4, UNITS: mg/KG, GROUP GCFID

TEST COMPOUND	BH7-3.5 & 9.5 COMPOSITE 87093222
GC PETROLEUM HYDROCARBONS	20

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 41

TASK: 4, UNITS: ug/KG, GROUP PCB

TEST COMPOUND	BH7-3.5 & 9.5 COMPOSITE 87093222	BH8-2.5 & 6.0 COMPOSITE 87093223
PCB-1016	ND	ND
PCB-1221	ND	ND
PCB-1232	ND	ND
PCB-1242	ND	ND
PCB-1248	ND	ND
PCB-1254	ND	ND
PCB-1260	ND	ND

ND - Not Detected

ES
ENGINEERING-SCIENCE, INC.

600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 548-7970

See revised report 9/21/87

Job No.: 56449.06
Client: ES Berkeley
Attention: Katherine Chesick
Copy: Rick Makdisi

Project: Wareham/Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 9/8/87.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
87093222	GCFID	Results to Follow				
87093222	PCBs	9-8-87	14:19-14:33	9-10-87	9-11-87	
87093223	PCBs	9-8-87	15:01-15:21	9-10-87	9-11-87	
87093223	413.2	9-8-87	15:01-15:21	9-10-87	9-14-87	
87093223	418.1	9-8-87	15:01-15:21	9-10-87	9-14-87	
87093224	413.2	9-8-87	15:35	9-10-87	9-14-87	
87093224	418.1	9-8-87	15:35	9-10-87	9-14-87	

* If applicable

Detection Limits
Environmental Quality Parameters
Samples No.: 87093223 and 87093224

Parameter	Units	Detection Limits
413.2 Petroleum Hydrocarbons	mg/KG	100
418.1 Petroleum Hydrocarbons	mg/KG	100

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
PCBs
EPA 608/8080
Samples No.: 87093222 and 87093223

Compound	Detection Limits
PCB-1016	50 ug/KG
PCB-1221	50 ug/KG
PCB-1232	50 ug/KG
PCB-1243	50 ug/KG
PCB-1248	50 ug/KG
PCB-1254	50 ug/KG
PCB-1260	50 ug/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ANALYSIS REPORT

ORK ORDER NUMBER: 41
OB NUMBER : ZB0000000278
WORK ORDER DATE : 09/09/87

APPROVED BY _____
Lab Supervisor

EPORT DATA:
ES BERKELEY/WAREHAM
600 BANCROFT WAY
ERKELEY, CA 94710
ICK MAKDISI

CLIENT DATA:
ES BERKELEY/WAREHAM (27)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : 56449.06
CONTACT : RICK MAKDISI
(415)-548-7970

TASK: 3, UNITS: mg/KG

TEST COMPOUND	BH8-2.5,6.0&9.0 COMPOSITE 87093223	BH3-1.0 87093224
413.2 PETROLEUM HYDROCARBONS	<100	100
418.1 PETROLEUM HYDROCARBONS	<100	<100

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 41

ASK: 4, UNITS: ug/KG, GROUP PCB

TEST COMPOUND	BH7-3.5 & 9.5 COMPOSITE 87093222	BH8-2.5,6.0&9.0 COMPOSITE 87093223
PCB-1016	ND	ND
PCB-1221	ND	ND
PCB-1232	ND	ND
PCB-1242	ND	ND
PCB-1248	ND	ND
PCB-1254	ND	ND
PCB-1260	ND	ND

ND - Not Detected

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

CLIENT:	PROJECT MANAGER:	PROJ. NO.:
ENGINEERING-SCIENCE, INC. BERKELEY	Rick Makdisi	

PROJECT NAME / LOCATION: Wareham Development / 63rd St.

SAMPLER(S): (SIGNATURE) Wayne Hauck — Wayne Hauck

SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION	NO. OF CONTAINERS	ANALYSES REQUIRED: GC/FID Total Petroleum Hydrocarbons	418.1	413.2				PRESERVED	TO BE COMPOSITED BY LAB	REMARKS
BH6-1.0	9/2/87	10:40	Soil		1	X								COMPOSITE 87319
BH6-3.5	↓	10:50	"		1	X								
BH4-2.5		11:03	Soil		1	X								COMPOSITE 87319
BH4-4.5		11:18	"		1	X								
BH5-2.5		11:50	Soil		1	X								COMPOSITE 87319
BH5-6.0		12:04	"		1	X N/A								
BH1-2.5		13:50	Soil		1	~~X~~	X	X						COMPOSITE 87319
BH1-6.5	↓	14:05	"		1		X	X						

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Wayne Hauck	9/2/87 4:00	R W Burton			

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
		J. [illegible]	9/2/87 1700	May be lots of vegetable grease & oil in samples. 1 WEEK TURNAROUND

DISTRIBUTION: ORIGINAL ACCOMPANIES SHIPMENT; COPY TO COORDINATOR FIELD FILES

ENGINEERING-SCIENCE, INC.

600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 548-7970

Job No.: NC065.01 Invoice # 28

Client: ES Berkeley

Attention: Katherine Chesick

Copy: Rick Makdisi

Project: Wareham/Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 9/2/87.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
87093191	GCFID	9-2-87	10:40-10:50	9-3-87	9-11-87	
87093192	GCFID	9-2-87	11:03-11:18	9-3-87	9-11-87	
87093193	GCFID	9-2-87	11:50-12:04	9-3-87	9-11-87	
87093194	413.2	9-2-87	13:50-14:05	9-11-87	9-14-87	
87093194	418.1	9-2-87	13:50-14:05	9-11-87	9-14-87	

Characterizations:

87093191 = Gasoline
87093192 = Gasoline
87093193 = Gasoline and a small amount (<5%) #2 Diesel

* If applicable

Detection Limits
FID Scan
Samples No.: 87093191 - 87093193

Compound	Detection Limits
Petroleum Hydrocarbons	10 mg/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

Detection Limits
Environmental Quality Parameters
Sample No.: 87093194

Parameter	Units	Detection Limits
413.2 Total Oil and Grease-IR	mg/KG	100
418.1 Petroleum Hydrocarbons	mg/KG	100

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ANALYSIS REPORT

WORK ORDER NUMBER: 31
JOB NUMBER : ZB0000000360
WORK ORDER DATE : 09/21/87

APPROVED BY R W Buxton
Lab Supervisor

REPORT DATA:
ES BERKELEY/PETERSON MANUFACT.
600 BANCROFT WAY
BERKELEY, CA 94710
ATTENTION CHRISTOF

CLIENT DATA:
ES BERKELEY/PETERSON MANUFACT. (34.
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : NC060.01
CONTACT : NATHOLINE CHRISTOF
(415)-548-7270

MATRIX: S, UNITS: mg/KG

TEST COMPOUND	DH1-2.5 & 4.5 COMPOSITE 87093194
413.2 TOTAL OIL AND GREASE-IR	4800
418.1 PETROLEUM HYDROCARBONS	1900

ND = Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 31

BASIS: A, UNITS: mg/KG, GROUP 8CFTD

TEST COMPOUND	BH6-1.0 & 7.5 COMPOSITE 87093191	BH4-2.5 & 4.5 COMPOSITE 87093192	BH5-2.5 & 4.0 COMPOSITE 87093193
GC PETROLEUM HYDROCARBONS	17	1300	1300

ND = Not Detected

ES
ENGINEERING-SCIENCE, INC.

600 BANCROFT WAY
BERKELEY, CALIFORNIA 94710
(415) 548-7970

see revised report 9/21/87

Job No.: 56449.06
Client: ES Berkeley
Attention: Katherine Chesick
Copy: Rick Makdisi

Project: Wareham/Peterson Manufacturing

Attached are the analytical reports for the soil samples received by this laboratory on 9/2/87.

Sample preparation data

Laboratory Sample No.	Test	Date collected	Time collected	Date* extracted	Date analyzed	Date* 2nd col.
87093191	GCFID	9-2-87	10:40-10:50	9-3-87	9-11-87	
87093192	GCFID	9-2-87	11:03-11:18	9-3-87	9-11-87	
87093193	GCFID	9-2-87	11:50-12:04	9-3-87	9-11-87	

Characterizations:

87093191 = Gasoline
87093192 = Gasoline
87093193 = Gasoline and a small amount (<5%) #2 Diesel

* If applicable

Detection Limits
FID Scan
Samples No.: 87093191 - 87093193

Compound	Detection Limits
Petroleum Hydrocarbons	10 mg/KG

The method detection limits listed are based upon the EPA method listed. Dilution or other deviations from the normal procedures, required due to characteristics of a sample, will influence these values. These changes are described in the report narrative if applicable.

ENGINEERING-SCIENCE INC.
09/15/87

ANALYSIS REPORT

WORK ORDER NUMBER: 31
JOB NUMBER : ZB0000000278
WORK ORDER DATE : 09/03/87

APPROVED BY _____
Lab Supervisor

REPORT DATA:
ES BERKELEY/WAREHAM
600 BANCROFT WAY
BERKELEY, CA 94710
RICK MAKDISI

CLIENT DATA:
ES BERKELEY/WAREHAM (27)
600 BANCROFT WAY
BERKELEY, CA 94710

OF REPORT COPIES: 1

CONTRACT / PO # : 56449.06
CONTACT : RICK MAKDISI
(415)-548-7970

MASK: 3, UNITS: mg/KG

TEST COMPOUND	BH1-2.5 & 6.5 COMPOSITE 87093194
413.2 PETROLEUM HYDROCARBONS	4800
418.1 PETROLEUM HYDROCARBONS	2650

see revised data 9/21/87 report

ND - Not Detected

ANALYSIS REPORT FOR WORK ORDER NUMBER 31

TASK: 4, UNITS: mg/KG, GROUP GCFID

TEST COMPOUND	BH6-1.0 & 3.5 COMPOSITE 87093191	BH4-2.5 & 4.5 COMPOSITE 87093192	BH5-2.5 & 6.0 COMPOSITE 87093193
GC PETROLEUM HYDROCARBONS	17	1300	1300

ND - Not Detected

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
Richmond, CA 94804 0040
(415) 235-2633

SAMPLE RECEIPT FORM

SAMPLES WERE RECEIVED AS FOLLOWS:

Company Name: Engineering-Science, Inc.

Address: 600 Bancroft Way

City: Berkeley, CA **Zip** 94710

Phone Number: 548-7970

Purchase Order Number (if known): NC 065

Brought in by: Eric N. Storrs

Send Report to: ATTN: Dan McCullar

Analysis Requested: CAM Metals

Number and Type of Samples: 1 - 1 qt. Jar - Soil

Date Received: 5/11/88 **Time Received:** 17:30

Received By: JED

Detection Limit Required:

Turn-around-time required: please check one **Normal** ☐

RUSH: **8-hour** ☐ **24-hour** ☒ **48-hour** ☐

NC065

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
(415) 783-6960

TAL

DATE: 3/14/88

LOG NO.: 5709

DATE SAMPLED: 2/26/88

DATE RECEIVED: 2/26/88

COPY

CUSTOMER: Delucchi Well And Pump

REQUESTER: John Delucchi

PROJECT: No. 30248, O'Neill

Sample Type: Liquid

Method and Constintuent	Units	No. 1 Water Well - 30428-1 Concentration	Detection Limit
Modified EPA Method 8015:			
Extractable Hydrocarbons	ug/l	17,000,000	100,000

COPY

Hugh R. McLean

Hugh R. McLean
Supervisory Chemist

RECEIVED
MAR 23 1988
Engineering Science
Berkeley

HRM:gmc

MAR 18 RECD 88

3/21/88 Copy sent to Engineering Science
c/o attn: Katherine Mesick

APPENDIX B

WELL BOREHOLE LOGS AND CONSTRUCTION DETAILS

CLIENT WAREHAM DEVELOPMENT

LOCATION PETERSON MANUFACTURING CO. 63rd ST. EMERYVILLE, CA.

DATE 2 SEPTEMBER 1987

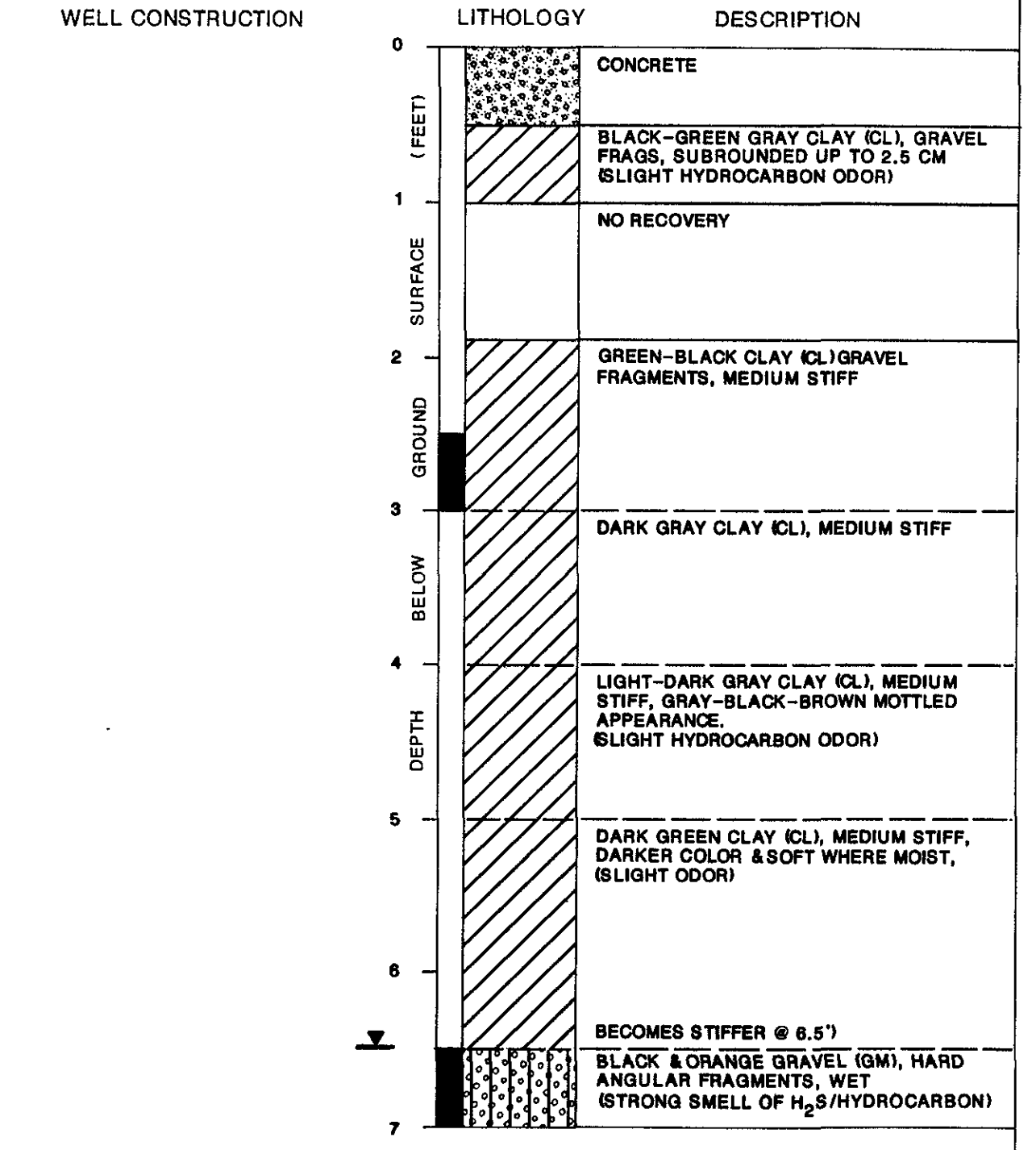
GEOLOGIST W. HAUCK

TEST HOLE NUMBER BH-1

DRILLER HANDRIVEN SAMPLING CO.

DRILLING METHOD HANDHELD SAMPLER

HOLE DIAMETER 1.25"



EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

LOCATION PETERSON MANUFACTURING CO. 63rd ST., EMERYVILLE CA.

DATE 8, 9 SEPTEMBER 1987

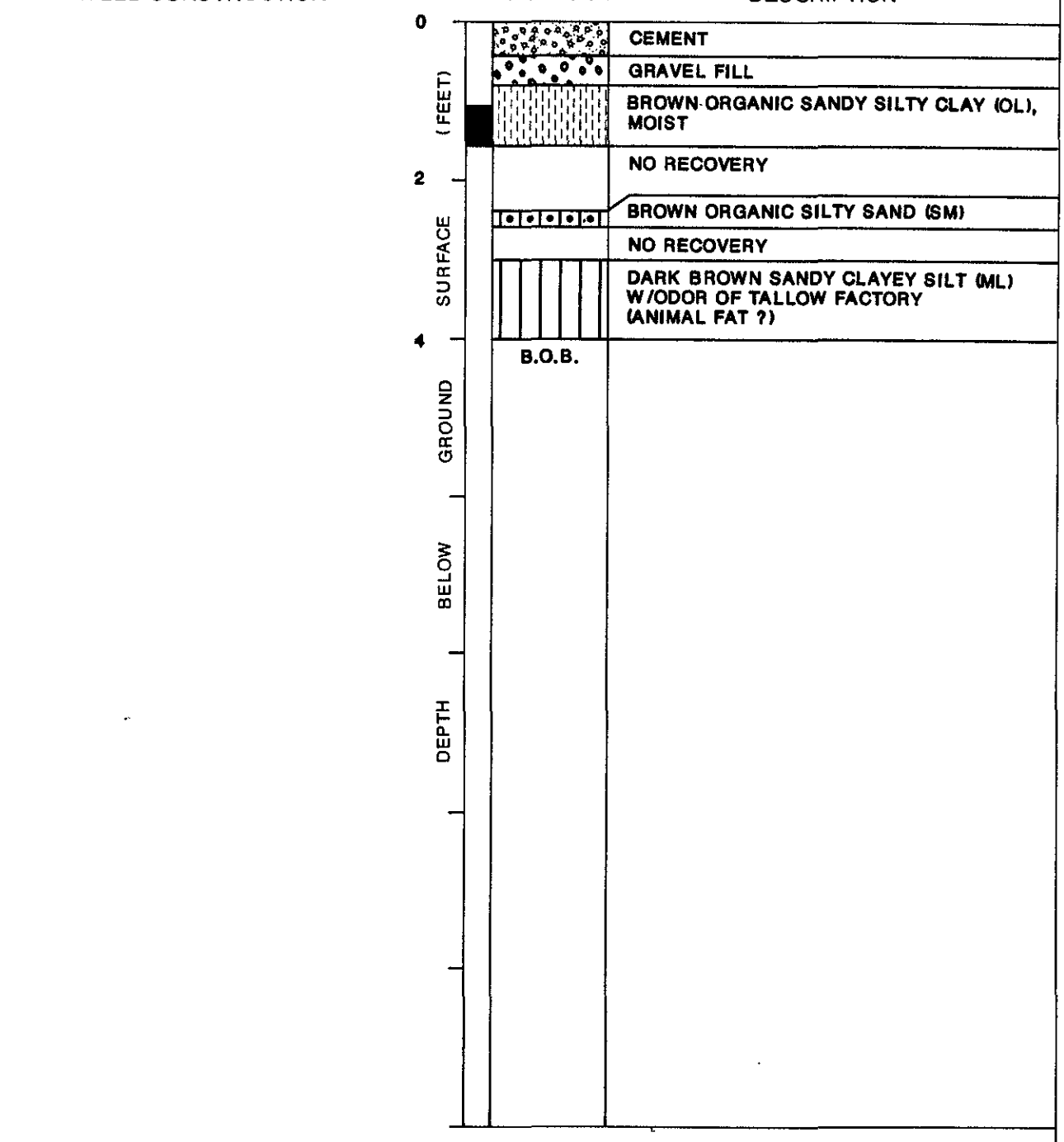
GEOLOGIST K. CHESICK

TEST HOLE NUMBER BH-3

DRILLER HANDRIVEN SAMPLING CO.

DRILLING METHOD HANDHELD SAMPLER

HOLE DIAMETER 1.25"



EXPLANATION

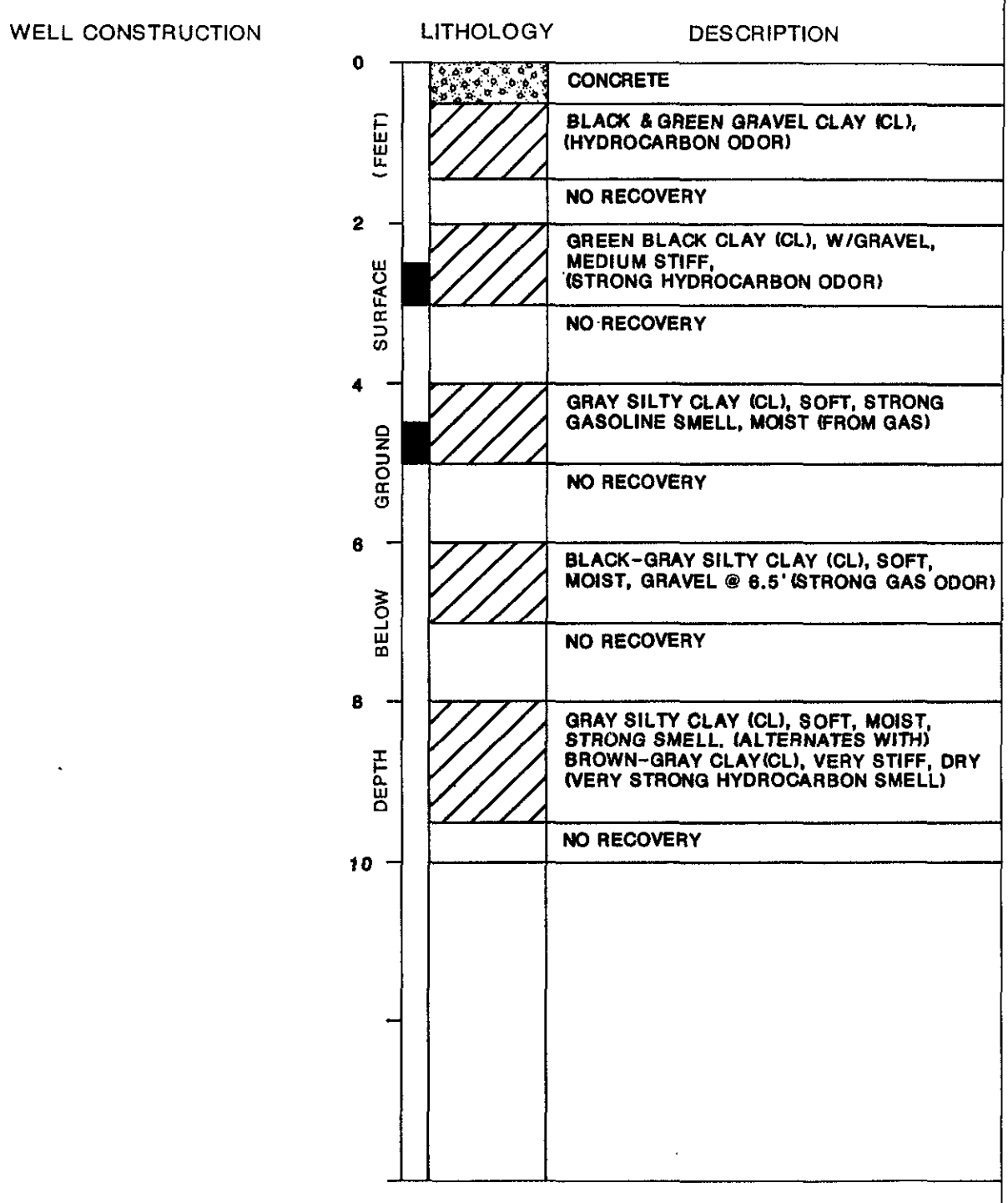
▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT
LOCATION PETERSON MANUFACTURING CO. 63 rd ST., EMERYVILLE, CA.
DATE 2 SEPTEMBER 1987
GEOLOGIST W. HAUCK

TEST HOLE NUMBER BH-4
DRILLER HANDRIVEN SAMPLING CO.
DRILLING METHOD HAND HELD SAMPLER
HOLE DIAMETER 1.25"



EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

ES ENGINEERING-SCIENCE

CLIENT WAREHAM DEVELOPMENT

TEST HOLE NUMBER BH-5

LOCATION PETERSON MANUFACTURING CO. 63rd ST. EMERYVILLE, CA.

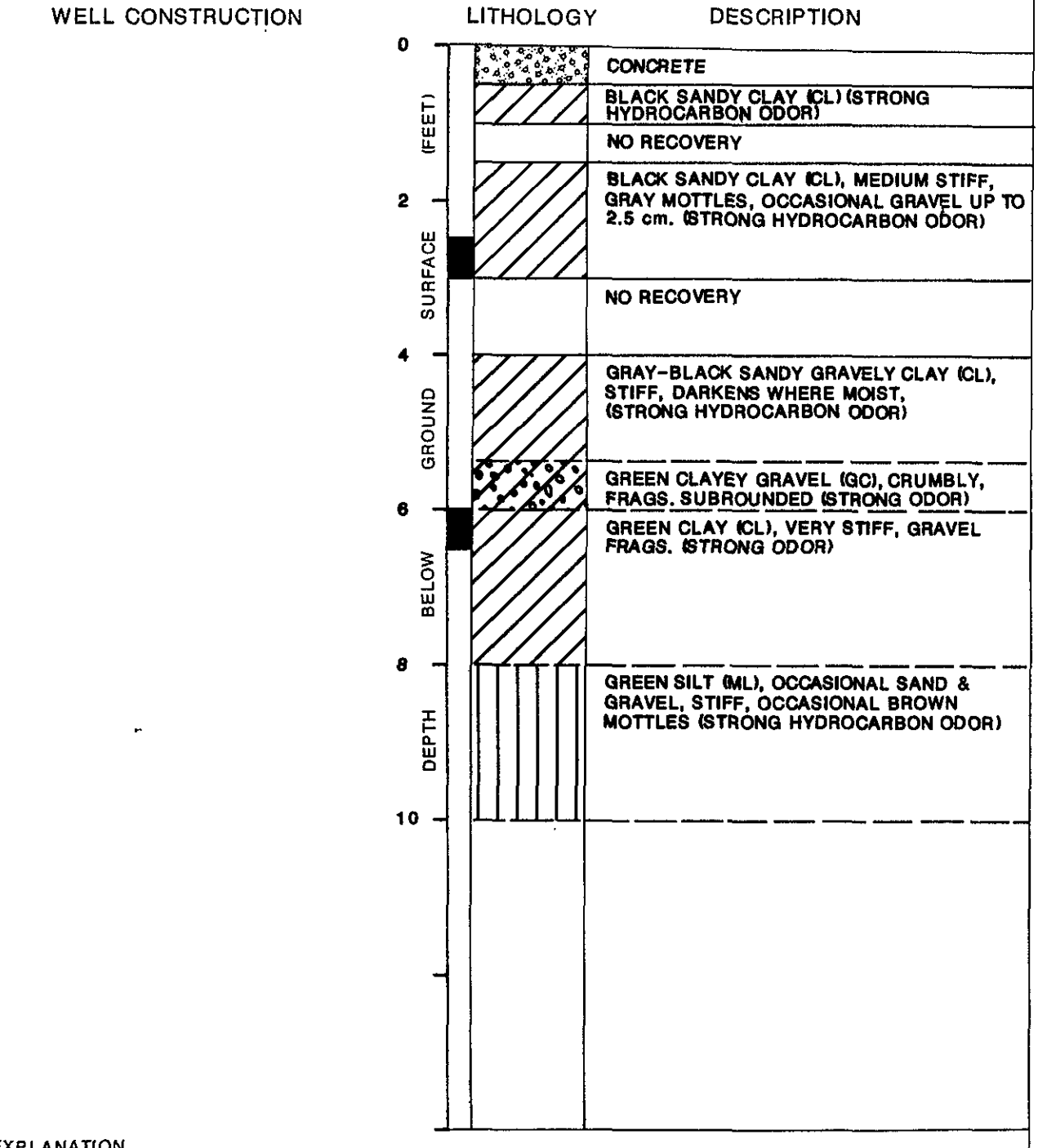
DRILLER HANDRIVEN SAMPLING CO.

DATE 2 SEPTEMBER 1987

DRILLING METHOD HANDHELD SAMPLER

GEOLOGIST W. HAUCK

HOLE DIAMETER 1.25"



EXPLANATION

▼ Water level during drilling

—— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

LOCATION PETERSON MANUFACTURING CO. 63rd ST., EMERYVILLE, CA.

DATE 2 SEPTEMBER 1987

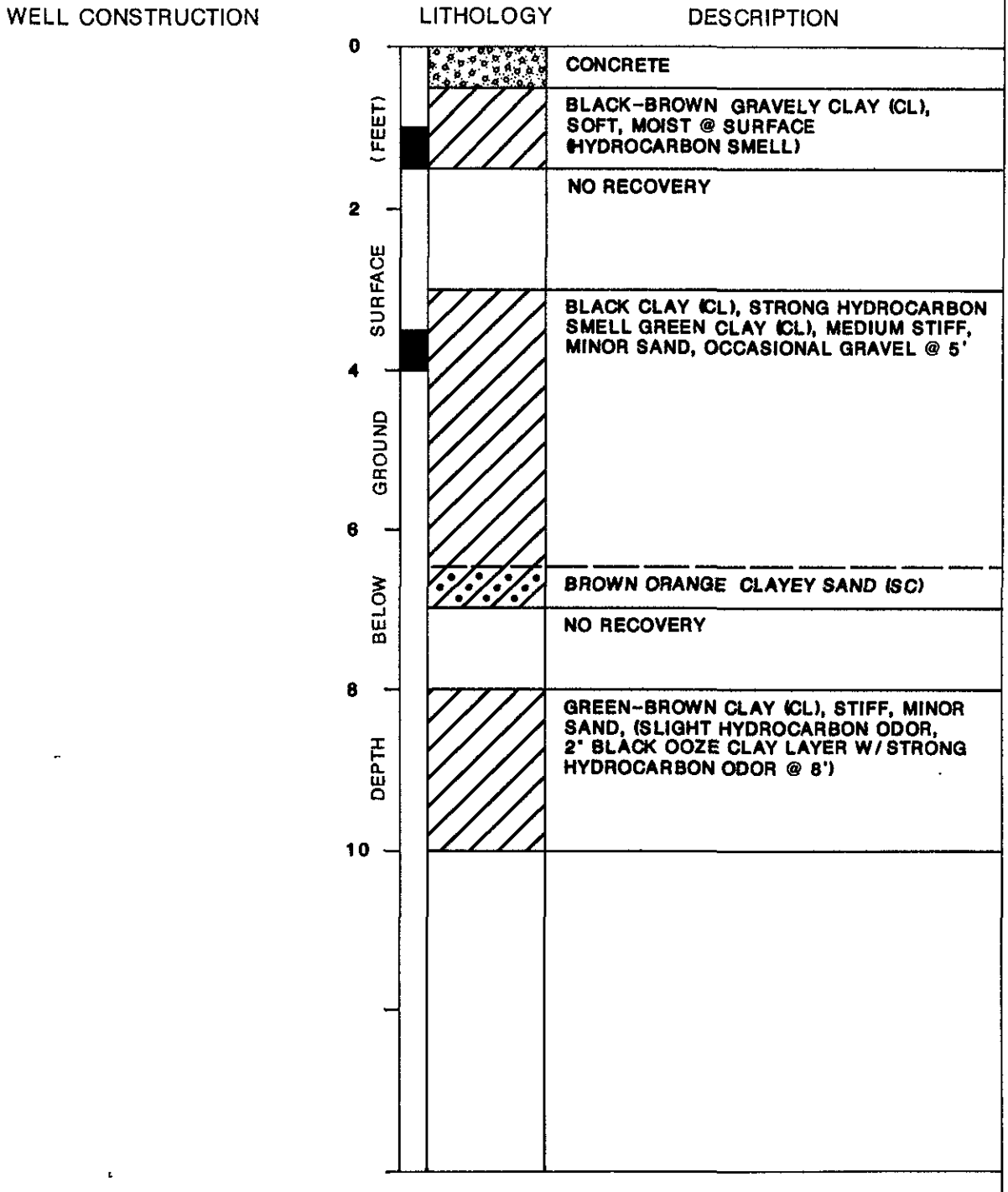
GEOLOGIST W. HAUCK

TEST HOLE NUMBER BH-6

DRILLER HANDRIVEN SAMPLING CO.

DRILLING METHOD HANDHELD SAMPLER

HOLE DIAMETER 1.25"



EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

LOCATION PETERSON MANUFACTURING CO. 63rd ST., EMERYVILLE CA.

DATE 8 SEPTEMBER 1987

GEOLOGIST K. CHESICK

TEST HOLE NUMBER BH-7

DRILLER HANDRIVEN SAMPLING CO.

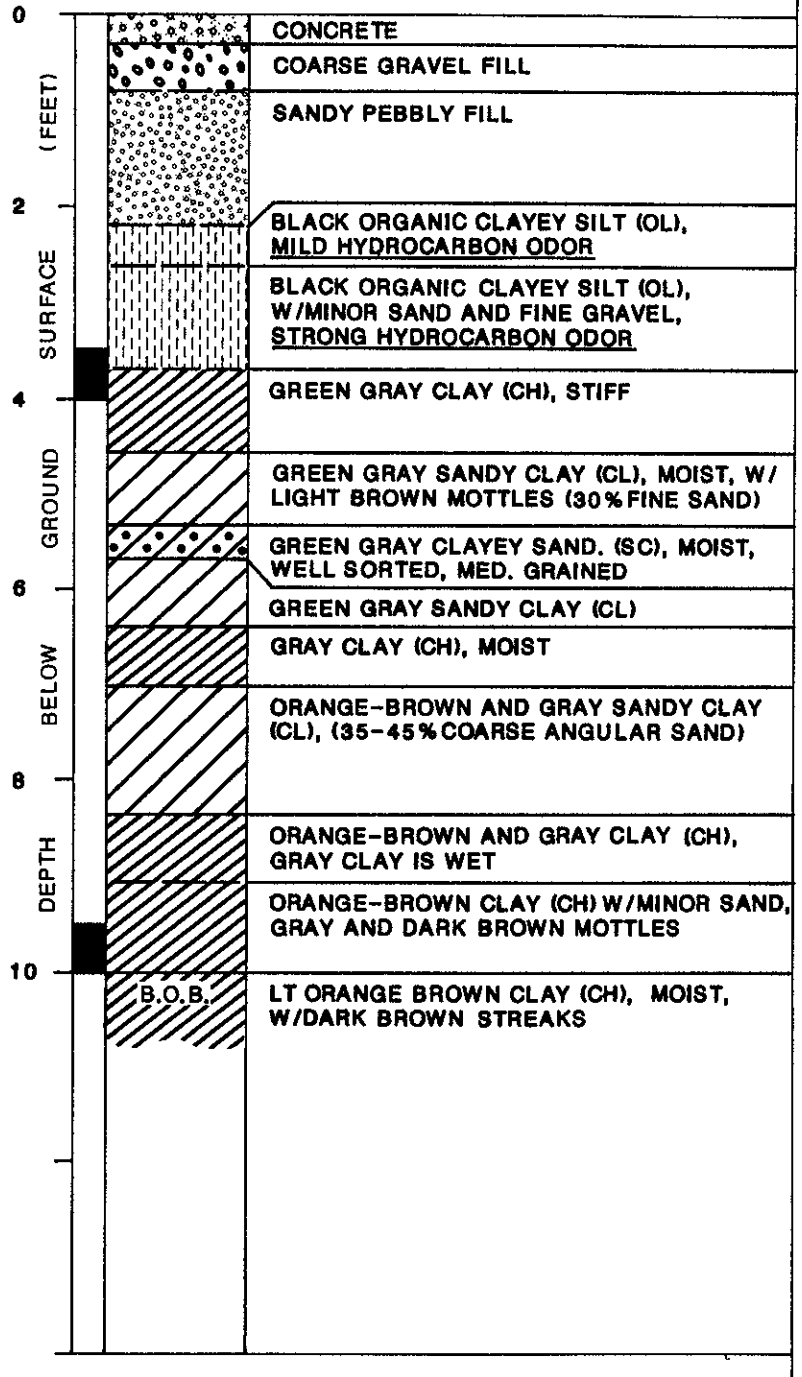
DRILLING METHOD HANDHELD SAMPLER

HOLE DIAMETER 1.25"

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

LOCATION PETERSON MANUFACTURING CO. 63rd ST., EMERYVILLE CA.

DATE 8 SEPTEMBER 1987

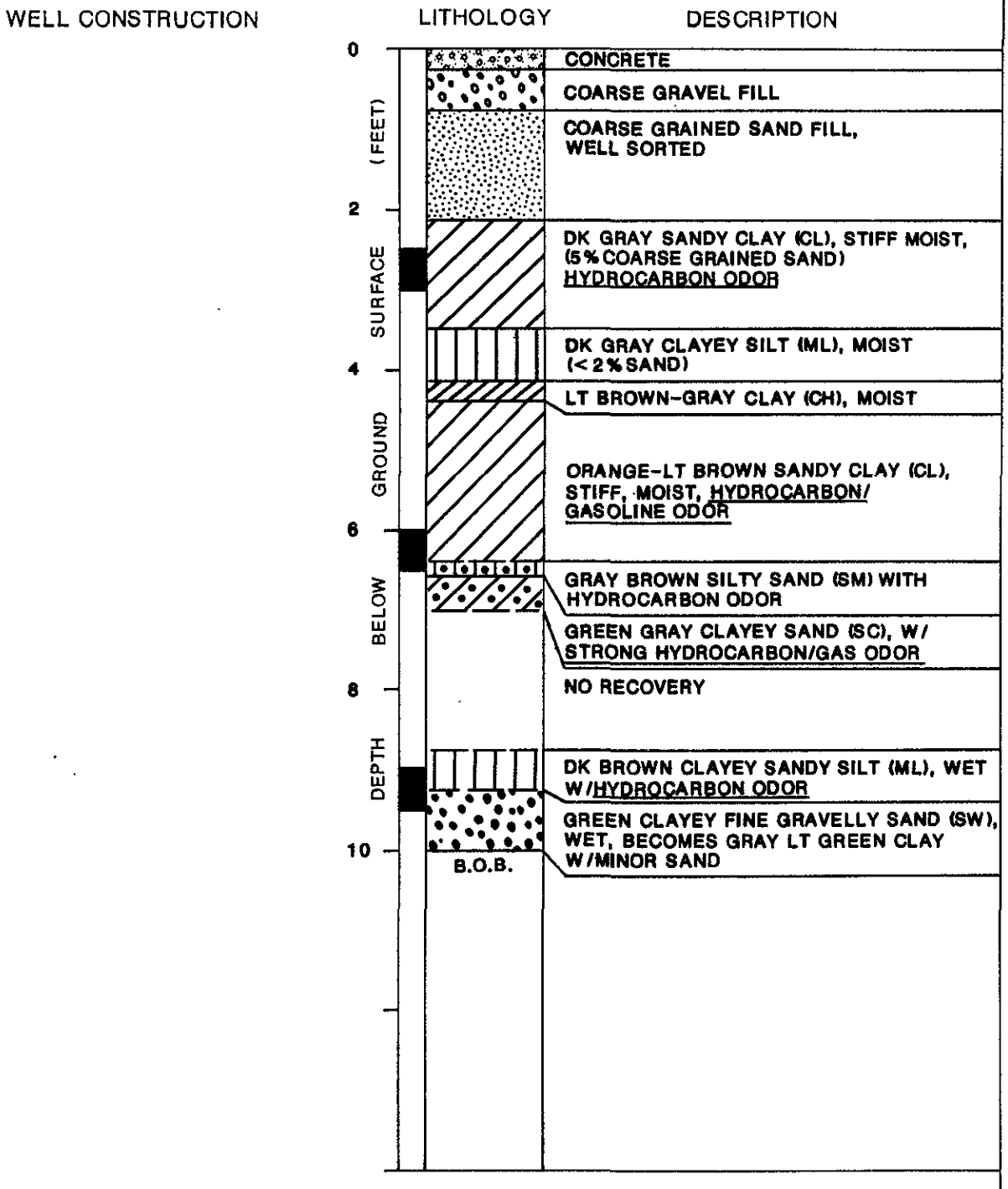
GEOLOGIST K. CHESICK

TEST HOLE NUMBER BH-8

DRILLER HANDRIVEN SAMPLING CO.

DRILLING METHOD HANDHELD SAMPLER

HOLE DIAMETER 1.25"



EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

LOCATION PETERSON MANUFACTURING CO. 63rd ST., EMERYVILLE CA.

DATE 9 SEPTEMBER 1987

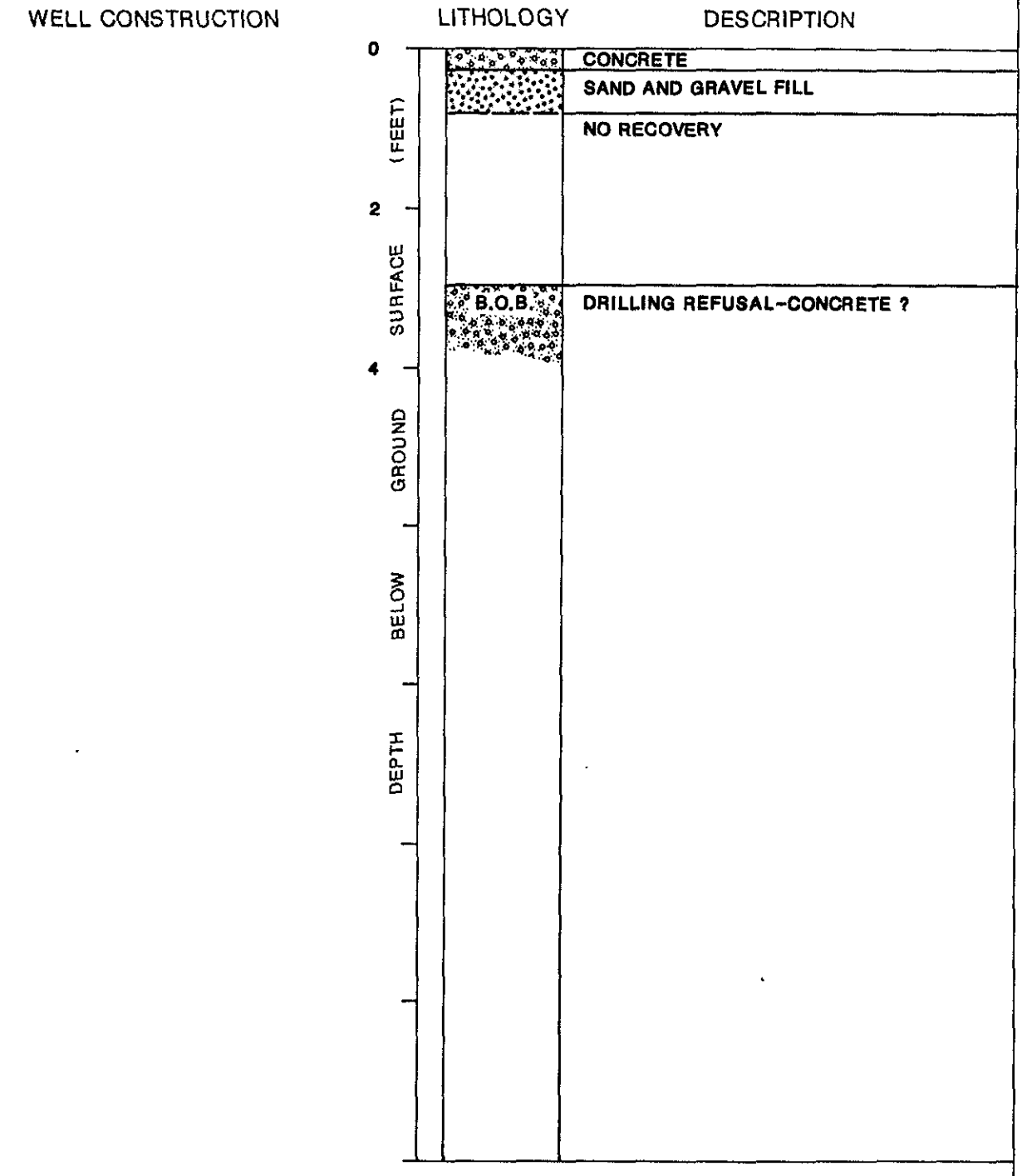
GEOLOGIST K. CHESICK

TEST HOLE NUMBER BH-9

DRILLER HANDRIVEN SAMPLING CO.

DRILLING METHOD HANDHELD SAMPLER

HOLE DIAMETER 1.25"



EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

LOCATION PETERSON MANUFACTURING CO. 63rd ST, EMERYVILLE CA.

DATE 9 SEPTEMBER 1987

GEOLOGIST K. CHESICK

TEST HOLE NUMBER BH-9A

DRILLER HANDRIVEN SAMPLING CO.

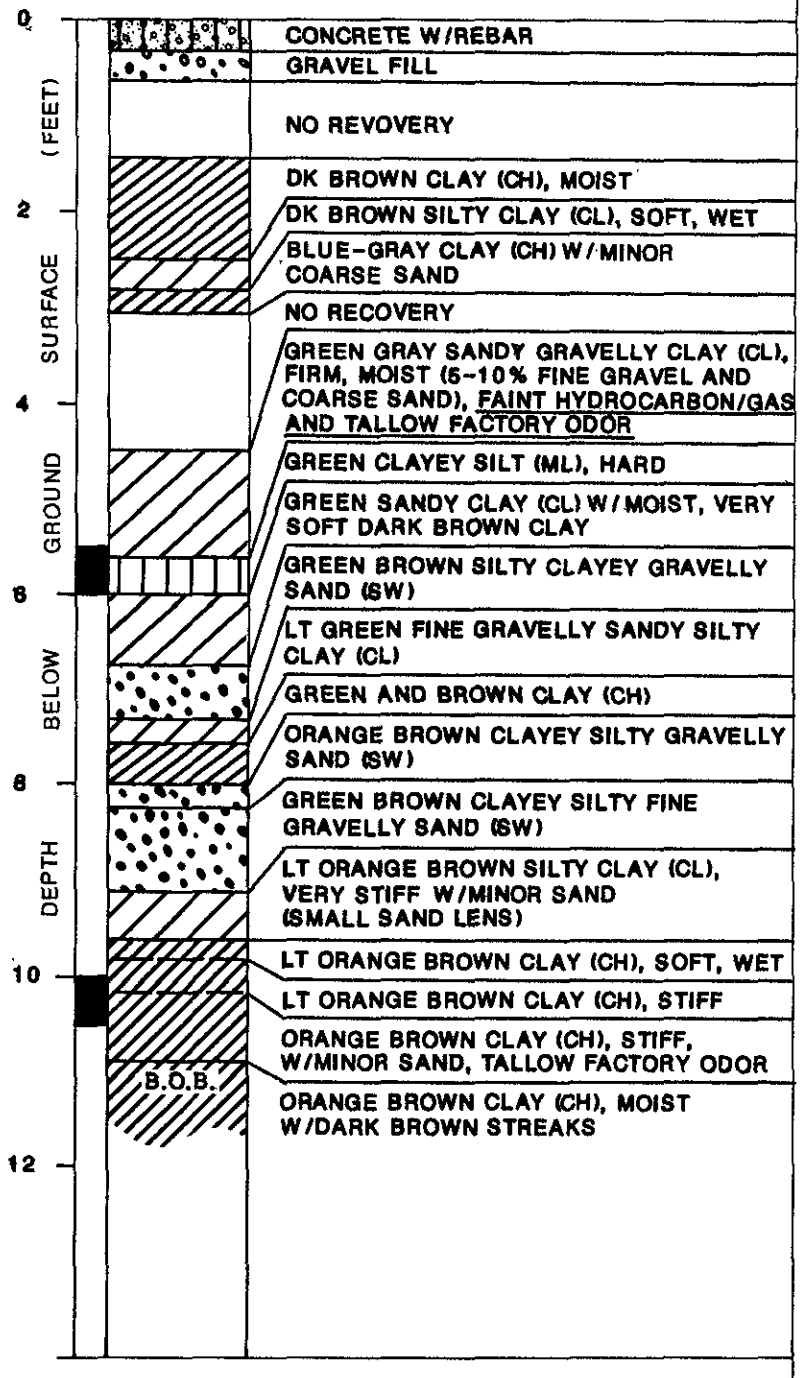
DRILLING METHOD HANDHELD SAMPLER

HOLE DIAMETER 1.25"

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

LOCATION PETERSON MANUFACTURING CO. 63rd ST., EMERYVILLE CA.

DATE 9 SEPTEMBER 1987

GEOLOGIST K. CHESICK

TEST HOLE NUMBER BH-10

DRILLER HANDRIVEN SAMPLING CO.

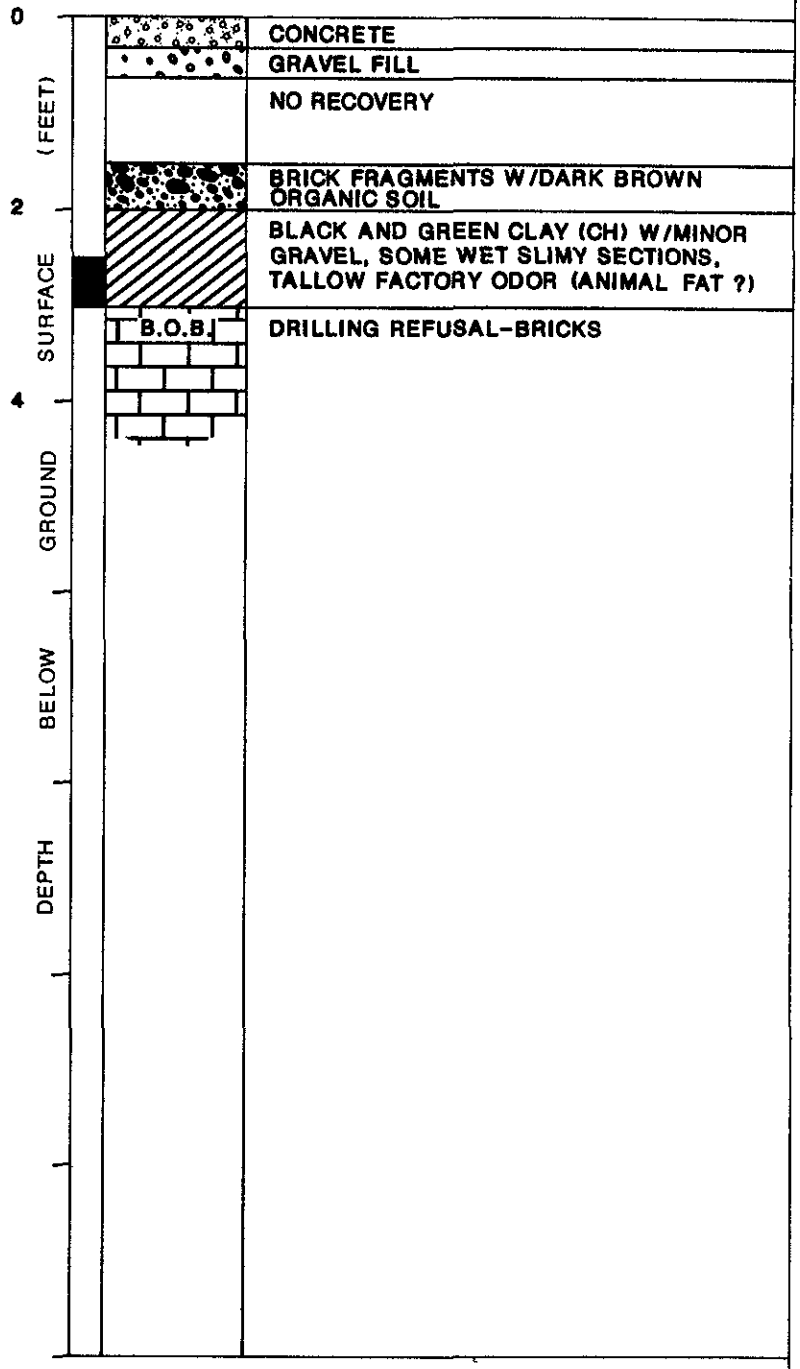
DRILLING METHOD HANDHELD SAMPLER

HOLE DIAMETER 1.25"

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT Wareham Development
Peterson Manufacturing Co.

TEST HOLE NUMBER MW-1

LOCATION 63rd St., Emeryville, CA

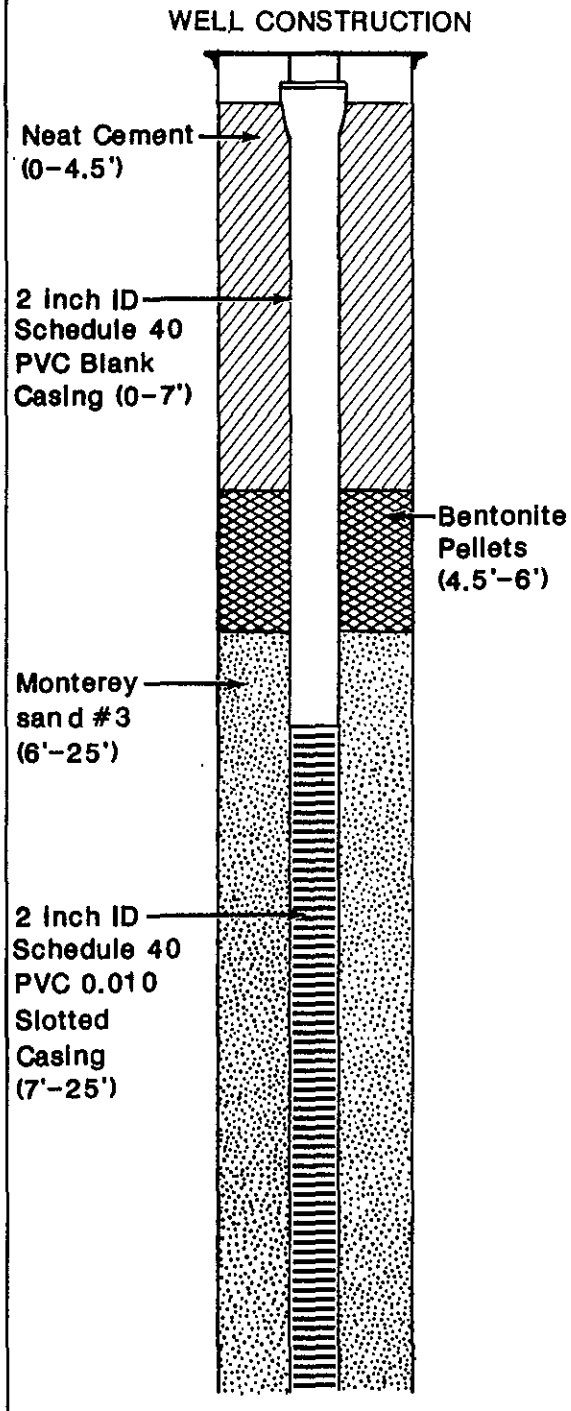
DRILLER Chris St. Pierre
Aqua Science Engineers

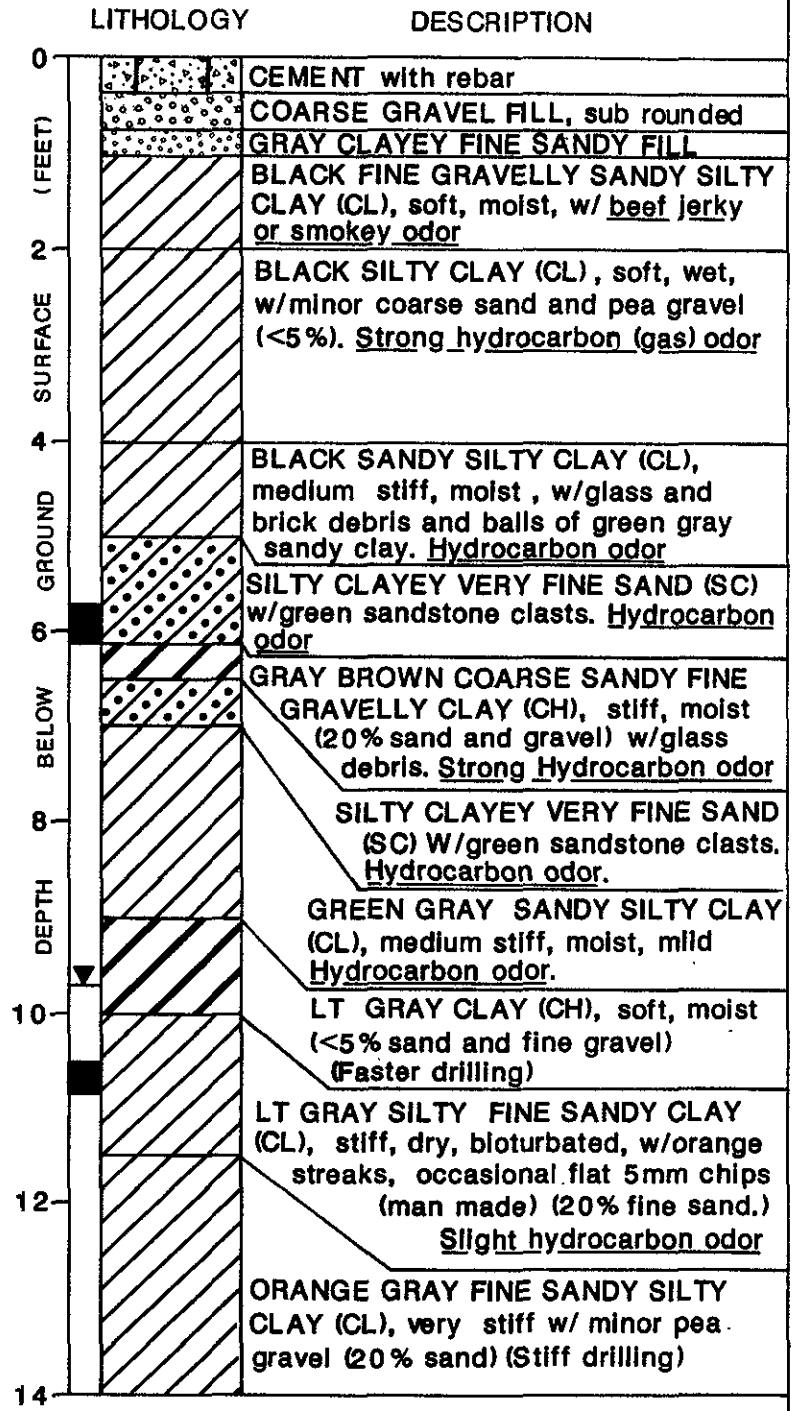
DATE 5 November 1987

DRILLING METHOD Hollow Stem Auger

GEOLOGIST K. Chesick

HOLE DIAMETER 8"





EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT Wareham Development
Peterson Manufacturing Co.

TEST HOLE NUMBER MW-1

LOCATION 63rd St., Emeryville, CA

DRILLER Chris St. Pierre
Aqua Science Engineers

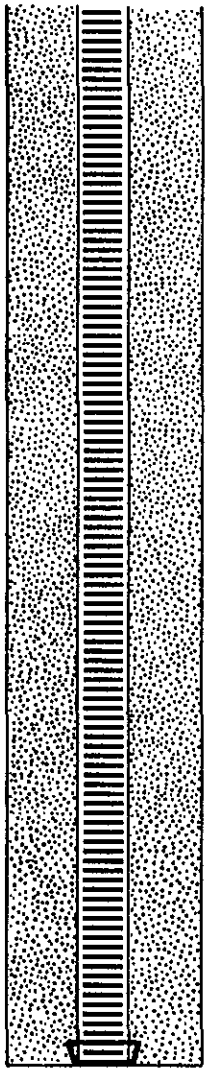
DATE 5 November 1987

DRILLING METHOD Hollow Stem Auger

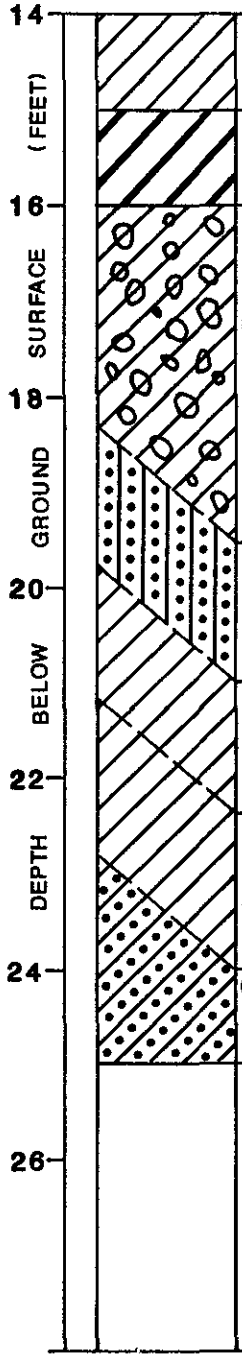
GEOLOGIST K. Chesick

HOLE DIAMETER 8"

WELL CONSTRUCTION



LITHOLOGY



DESCRIPTION

LIGHT GRAY BROWN MEDIUM SANDY CLAYEY SILT (ML), as a slurry, sticky w/pea gravel. Slight hydrocarbon odor

ORANGE BROWN CLAYEY SANDY FINE AND COARSE GRAVEL (GC), saturated with water coming out of hole, poorly sorted. Gasoline odor

ORANGE BROWN FINE GRAVELLY CLAYEY SILTY MEDIUM SAND (SM), saturated (10% gravel)

YELLOW BROWN GRAVELLY SANDY CLAY (CL), stiff (15% gravel, 30% sand)

(drilling slightly stiffer)

LT BROWN ORANGE COARSE SANDY FINE GRAVELLY SILTY CLAY (CL) stiff (Stiff drilling)

ORANGE BROWN SILTY CLAYEY MEDIUM SAND (SC) moist, w/fine gravel (slight softening in drilling)

Bottom of Boring

EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT Wareham Development
Peterson Manufacturing Co.

LOCATION 63rd St, Emeryville, CA

DATE 6 November 1987

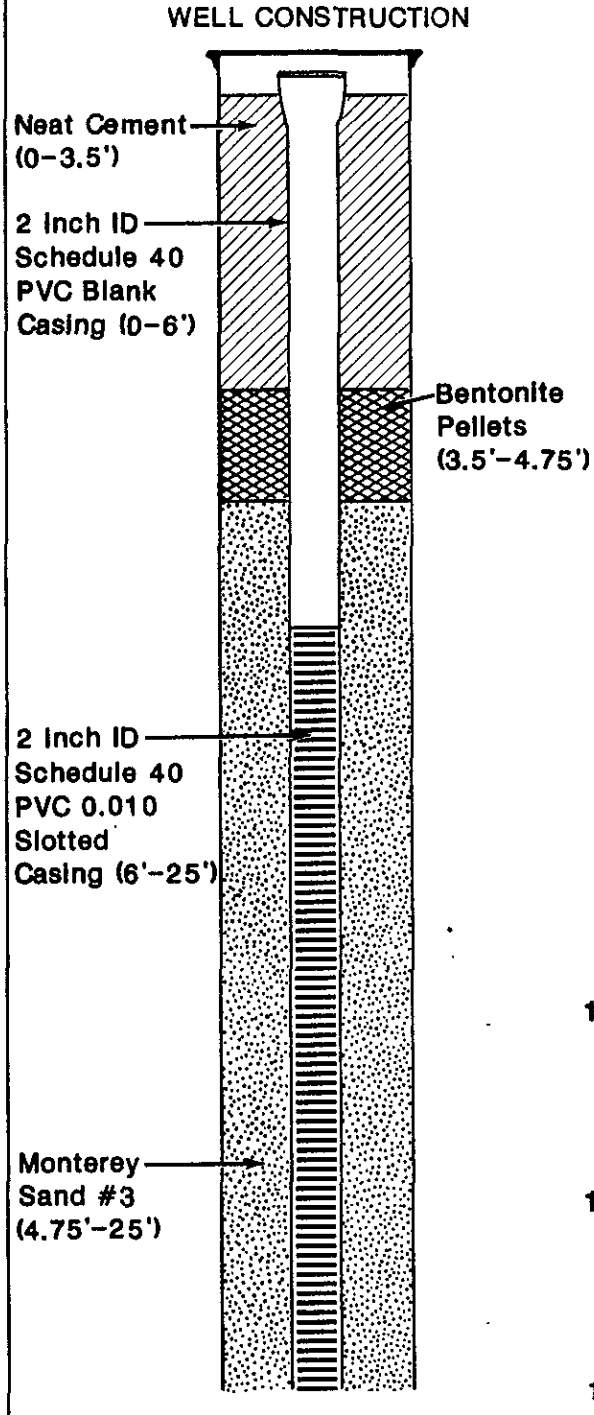
GEOLOGIST K. Chesick

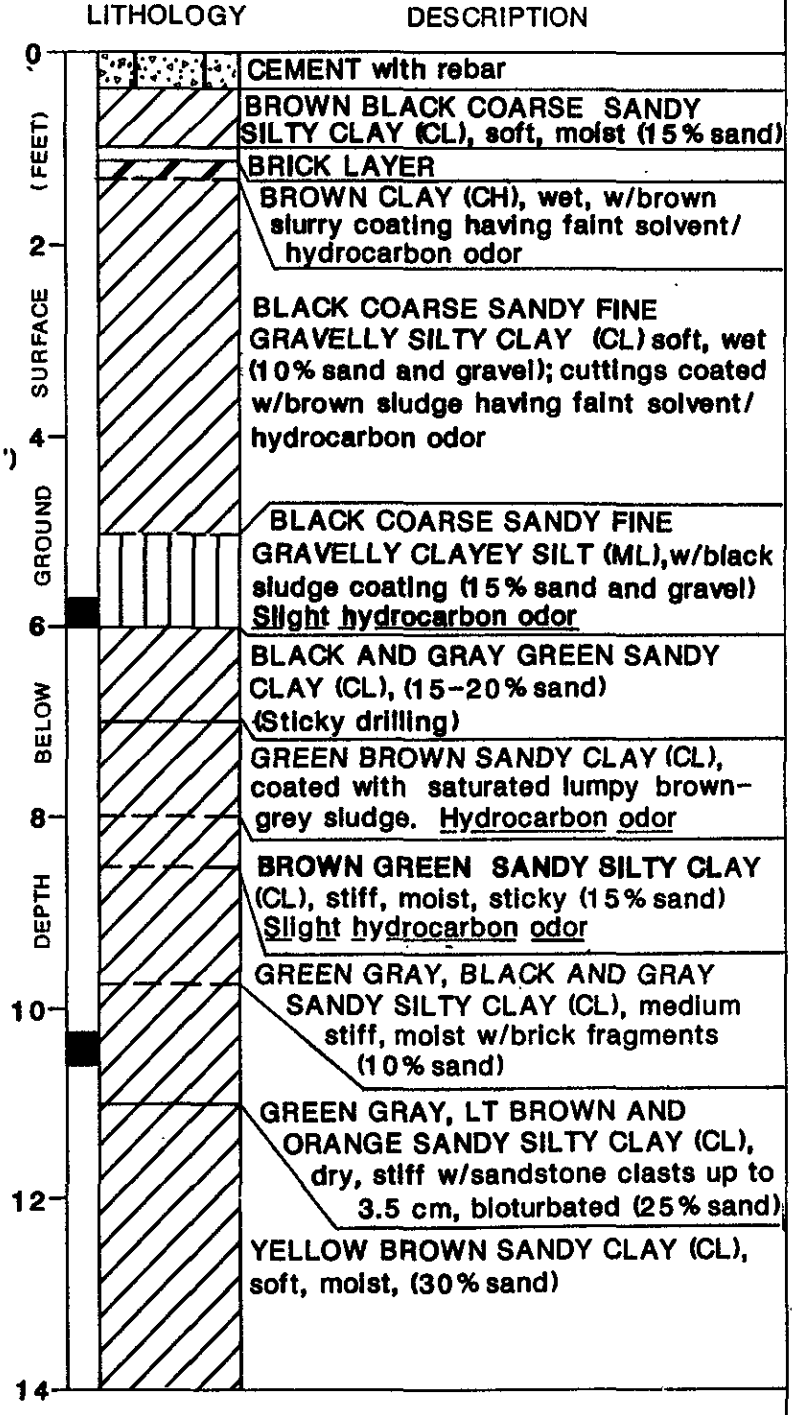
TEST HOLE NUMBER MW-2

DRILLER Chris St. Pierre
Aqua Science Engineers

DRILLING METHOD Hollow Stem Auger

HOLE DIAMETER 8"





EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT Wareham Development
Peterson Manufacturing Co.

TEST HOLE NUMBER MW-2
Chris Pierre

LOCATION 63rd St., Emeryville, CA

DRILLER Aqua Science Engineers

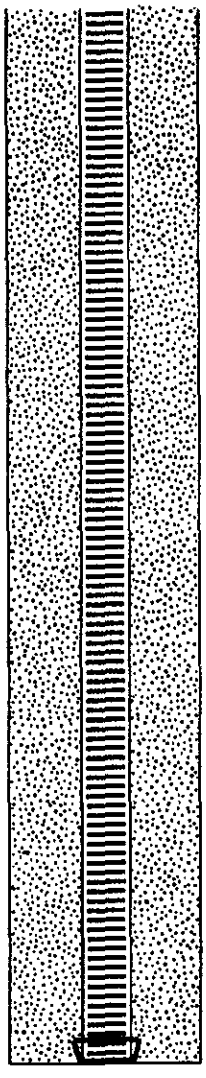
DATE 6 November 1987

DRILLING METHOD Hollow Stem Auger

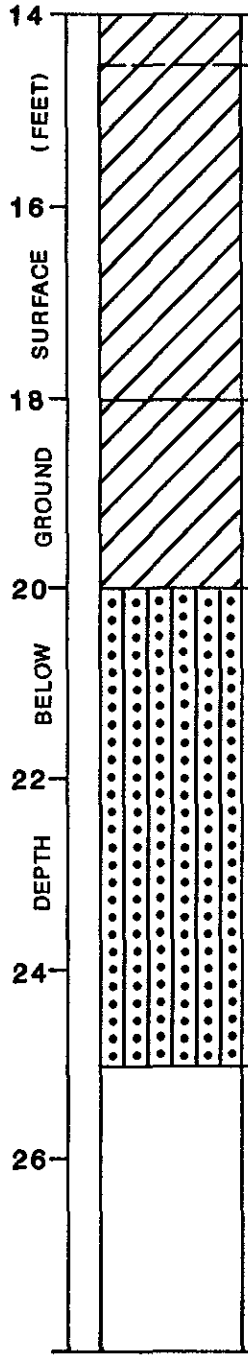
GEOLOGIST K. Chesick

HOLE DIAMETER 8"

WELL CONSTRUCTION



LITHOLOGY



DESCRIPTION

DARKER YELLOW BROWN SANDY CLAY (CL), soft, moist, sticky (40% sand) becomes grayer, stiffer with depth.

MEDIUM GRAY SANDY CLAY (CL), soft, moist (25%sand) w/black and medium brown streaks and brick fragments.

LT BROWN CLAYEY SILTY MEDIUM SAND (SM), comes out of hole as a very watery slurry. Slurry becomes thicker with increasing depth. Sand increases, becomes coarser. Angular fine gravel appears in cuttings.

Bottom of boring.

EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

LOCATION PETERSON MANUFACTURING CO. 63rd ST., EMERYVILLE, CA

DATE 6 JANUARY 1988

GEOLOGIST K. CHESICK

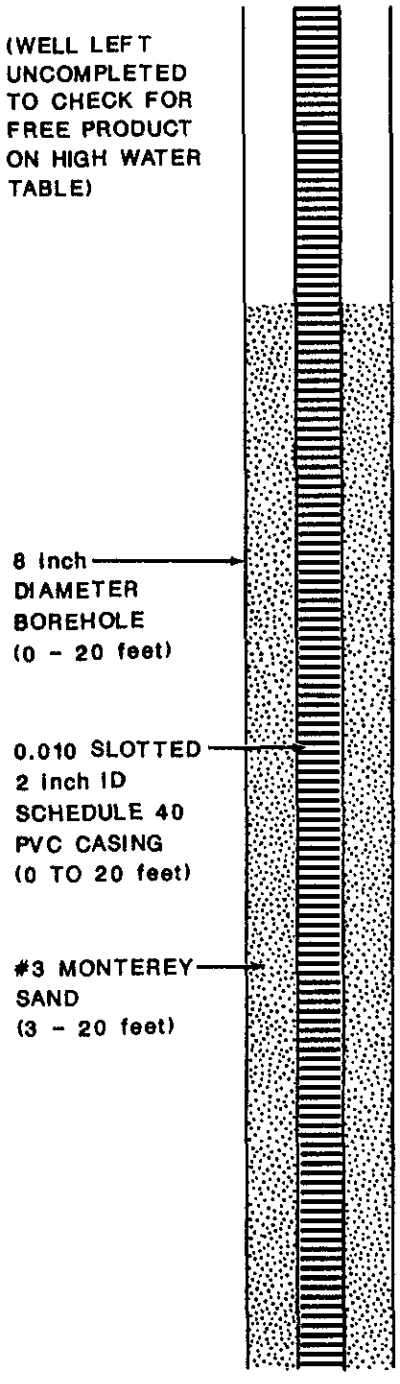
TEST HOLE NUMBER MW-3

DRILLER CHRIS ST. PIERRE AQUA SCIENCE ENGINEERS

DRILLING METHOD HOLLOW STEM AUGER

HOLE DIAMETER 8-inch

WELL CONSTRUCTION



LITHOLOGY / DESCRIPTION

DEPTH (FEET) BELOW GROUND SURFACE		
0		CONCRETE W/WIRE
		BRICK
		DK BROWN SILTY SAND (SM), SOFT, SATURATED, W/SMALL BRICK FRAGMENTS
2		GRAY GREEN FINE SANDY CLAY (CL), SOFT, MOIST, W/CHINA FRAGMENTS
		BLACK SANDY CLAY (CL), VERY SOFT, MOIST. HYDROCARBON ODOR
4		BLACK SILTY CLAY (CL), SOFT, WET W/MINOR SAND, INTERVALS OF BROWN GREEN CLAY WITH BRICK FRAGMENTS. STRONG DIESEL ODOR
	(1-4-9)	GREEN GRAY FINE SANDY SILTY CLAY (CL), STIFF, DRY, BIOTURBATED W/SOME BROWN BLACK CLAY. DIESEL ODOR
6		OIL SHEEN VISIBLE ON SURFACE OF 6.5' SAMPLE.
8	(6-11-14)	GREEN GRAY FINE GRAVELLY SILTY CLAY (CL), STIFF, DRY, W/ANGULAR GRAVEL. STRONG DIESEL ODOR; BROWN OILY SPOTS VISIBLE WHERE SAMPLE IS BROKEN OPEN. OIL SHEEN VISIBLE ON SAMPLE SURFACE.
10	N.R.	NOTE: AT 11 feet, WATER FLOWS UP AUGER; WATER HAS DARK BROWN OILY SUBSTANCE FLOATING ON IT, AND A DIESEL ODOR
	(13-17-23)	MED. GRAY GREEN CLAYEY V. COARSE SAND FINE GRAVEL (GC), POORLY SORTED, W/LIMONITIC STREAKS. STRONG DIESEL ODOR. OUTSIDE OF SAMPLER COATED WITH BROWN OILY SUBSTANCE.
12		(CUTTINGS ARE MOSTLY GRAY SILTY SLURRY)
14		

EXPLANATION

▼ Water level during drilling

——— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

LOCATION PETERSON MANUFACTURING CO. 63rd ST., EMERYVILLE, CA

DATE 6 JANUARY 1988

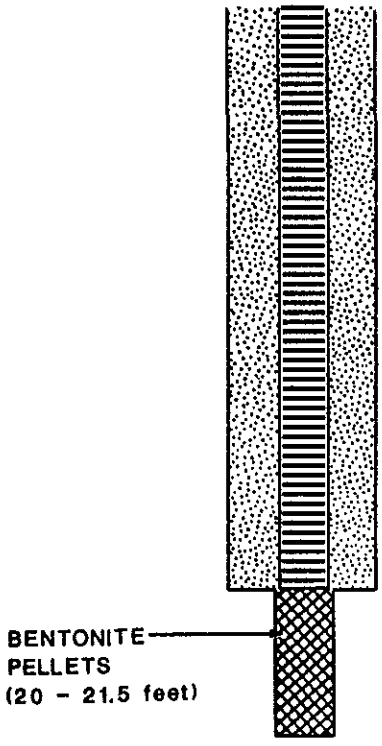
GEOLOGIST K. CHESICK

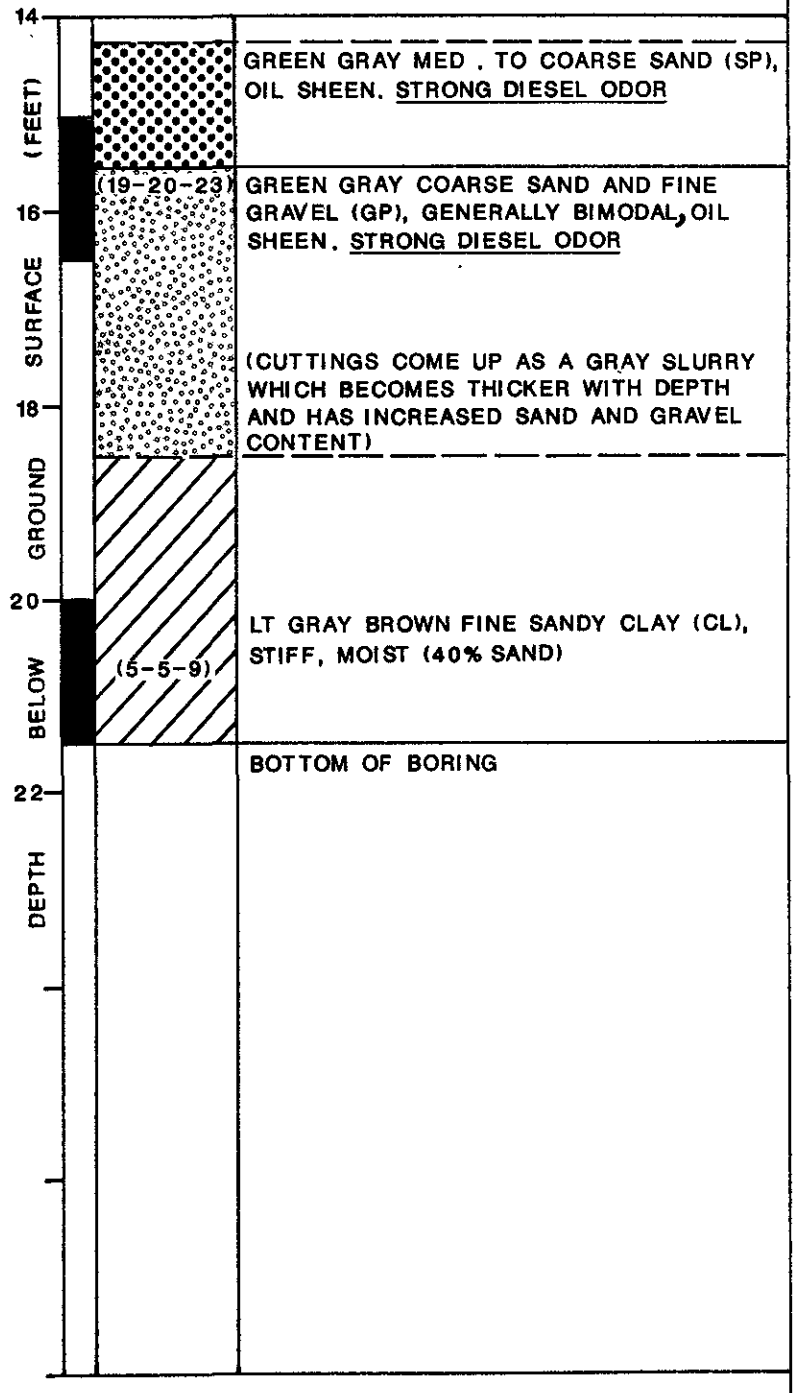
TEST HOLE NUMBER MW-3

DRILLER CHRIS ST. PIERRE AQUA SCIENCE ENGINEERS

DRILLING METHOD HOLLOW STEM AUGER

HOLE DIAMETER 8-inch





EXPLANATION

▼ Water level during drilling

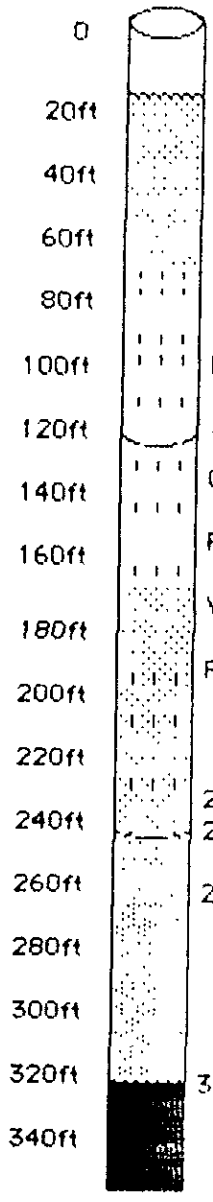
——— Contact (dashed where approximate)

■ Location of sample

APPENDIX C

WATER WELL VIDEO RECORD LOG

WATER WELL TECHNOLOGY



18 FEET. STANDING WATER LEVEL
WATER IS CLOUDY TO 72 FEET

72 FEET: VISIBLE PERFORATIONS FACTORY SLOT - HEAVY INCRUSTATION

PERFORATIONS ARE SPORADICALLY VISIBLE AT. 79' 90' 98' 113'

124 FEET: CASING JOINT

CASING IS HEAVILY INCRUSTED

PERFORATIONS SPORADICALLY VISIBLE AT 134' 149' 166'

WATER TURBIDITY IS POOR - BEGINS TO CLOUD

POSSIBLE PERFORATIONS AT 195' AND 213' DIFFICULT TO DETERMINE EXACT CASING CONDITIONS DUE TO HEAVY INCRUSTATION AND POOR WATER TURBIDITY

227 FEET POSSIBLE PERFORATIONS

247 FEET ROUGH JOINT - APPEARS SLIGHTLY OUT OF ROUND

260 FEET WATER BECOMES VERY CLOUDED - EXACT CASING CONDITIONS ARE DIFFICULT TO DETERMINE

321 FEET TOTAL DEPTH OBTAINED AT TIME OF THIS SCAN

VISUAL WELL LOG
BY: Robert J. Guardino

LOG NO.: 88-072
DATE: 11 MAY 1988

CONTRACTED BY:
MAGGIORA BROS. DRILLING

WELL IDENTIFICATION:
EMERYVILLE WELL

NOTES:

RECOMMEND CLEANING CASING INTERIOR TO REMOVE AS MUCH INCRUSTATION BUILD-UP AS POSSIBLE AND RE-VIDEO SCAN TO DETERMINE EXACT LOCATIONS OF PERFORATIONS.

CLEANING CAN BE PERFORMED VIA MANY METHODS AS LISTED

- WIRE BRUSHING
- ACIDIZATION TREATMENT
- VIBE-CLEANING (SONIC VIBRATION)

Water Well Specialties
P. O. Box 2875
Truckee, CA 95734-2875
(916) 587-2827

DE LUCCHI
WELL & PUMP, INC.

CONTRACTORS LICENSE # 394454
35137 MISSION BLVD. PHONE (415) 793-2822 FREMONT, CALIFORNIA 94536

February 26, 1988

J.M. O'Neill, Inc.
5177 Brandin Court
Fremont, CA. 94538

Attn: John O'Neill

1. A crew was dispatched to 1600 63rd Street in Emeryville on February 24, 1988, with instructions to pull the pump and measure the well so that an estimate for a well destruction could be prepared. The crew arrived at approximately 10 AM and entered the site by cutting a link from the chain securing the gate. They put one of our company locks in the chain per Mark Hill's previous instruction.

2. They pulled a 5 horsepower Jacuzzi oil lubricated line shaft turbine with 170' of 4" column, a 17 stage bowl assembly and 10' of tail pipe with a foot valve that did not hold. It is not uncommon for there to be a thick layer of oil on the water surface when an oil lubricated pump is in the well. As the pump is pulled through the oil layer, the pump becomes coated with it and an oil emulsion is spread around the site and on the trucks as the pump is disassembled. Because the well is at a relative high spot, the oily water went both ways. The crew did notice the smell of a petroleum product such as diesel oil, but dismissed it as having come from the nearby fuel island.

3. After pulling the pump, they measured the well using a flat bottomed bailer. A bailer is routinely used because regulatory bodies usually require a sample from the bottom of the well to confirm that the measuring device is not hanging on an obstacle and therefore giving a false depth. When the bailer was dumped, liquid from the well ran on to the concrete. The liquid on the south side of the well came from the bailer. The oily material on both sides of the well came off the pump as it was disassembled.

4. Normally, when there is an environmental concern about a well, we work under the direct supervision of the geological consultants who warn us of potential problems and closely monitor the operation to avoid hazarding a drilling crew.

5. Please call me if I may be of further assistance.

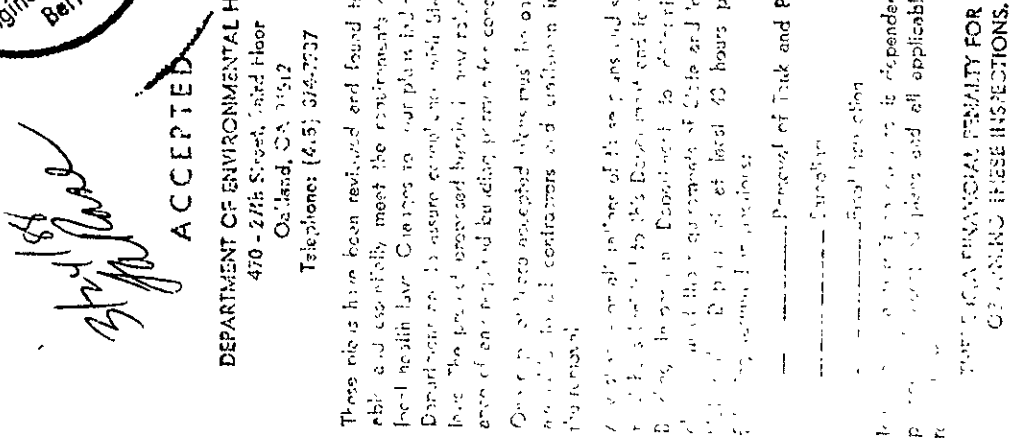
John DeLucchi

APPENDIX D

UNDERGROUND TANK CLOSURE PLAN AND MANIFESTS

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH
HAZARDOUS MATERIALS DIVISION
470 - 27TH ST., RM. 322
OAKLAND, CA 94612
PHONE NO. 415/874-7237

DRAFT



UNDERGROUND TANK CLOSURE/MODIFICATION PLANS

1. Business Name Peterson Manufacturing Company (former)

   Business Owner N.A.

2. Site Address 1600 63rd Street

   City Emeryville Zip 94608 Phone none

3. Mailing Address N.A. (see land owner)

   City _____ Zip _____ Phone _____

4. Land Owner Wareham Development

   Address 1120 Nye St., Ste. 400 City, State San Rafael, CA Zip 94901

5. EPA I.D. No. CAC 000064173

6. Contractor Plant Reclamation (Contractor to land owner)

   Address 912 Harbour Way So.

   City Richmond, CA 94804 Phone (415)233-6552

   License Type C21

7. Other (Specify) Engineering-Science (Environmental Consultant to land owner)

   Address 600 Bancroft Way

   City Berkeley, CA 94710 Phone (415)548-7970

DRAFT

8. Contact Person for Investigation

Name Katherine Chesick, Engineering-Science, Fred Glueck, Plant Reclamation Title Geologist, Contractor

Phone (415) 548-7970
(415) 233-6552

9. Total No. of Tanks at facility 4

10. Have permit applications for all tanks been submitted to this office? Yes [X] No [ ]
(See attachment B)

11. State Registered Hazardous Waste Transporters/Facilities

a) Product/Waste Tranporter

Name Erickson, Inc. EPA I.D. No. CAD 009466392

Address 255 Parr Blvd.

City Richmond State CA Zip 94801

b) Rinsate Transporter

Name Erickson, Inc. EPA I.D. No. CAD 009466392

Address 255 Parr Blvd.

City Richmond State CA Zip 94801

c) Tank Transporter

Name Erickson, Inc. EPA I.D. No. CAD 009466392

Address 255 Parr Blvd.

City Richmond, State CA Zip 94801

d) Contaminated Soil Transporter

Name NA, see attachment C EPA I.D. No. _____

Address _____

City _____ State _____ Zip _____

12. Sample Collector

Name Katherine Chesick/Eric Storrs

Company Engineering-Science, Inc.

Address 600 Bancroft Way

City Berkeley State CA Zip 94710 Phone 415/548-7970

DRAFT

13. Sampling Information for each tank or area

Tank or Area Tank 1		Material sampled	Location & Depth
Capacity	Historic Contents (past 5 years)		Northwestern site area, due east of the former solvent recovery plant
10,000 gallon	Stored hexane from 1965 to 1978. Circa mid 1986 stored diesel fuel which was transferred from Tank 4. Currently contains small amount of amber liquid and gray-brown sludge with diesel odor.	Gray brown sludge (tank sample)	Bottom of tank: 10.92 feet
		Soil (EB-4)	Southwest of Tank 1, 4.5 feet
		Soil (BH-10)	Southwest of Tank 1, 2.5 feet
		Soil (MW-3)	Southwest of Tank 1, 4.5 feet
		Water (MW-3)	Southwest of Tank 1

(Continued on next page)

14. Have tanks or pipes leaked in the past? Yes [ ] No [ ]

If yes, describe. Not known. Soil samples collected in the vicinity of the tanks indicate fuel leaks or spills have occurred.

15. NFPA methods used for rendering tank inert? Yes [ ] No [ ]

If yes, describe. The API Bulletin 1604 method will be used to inert each tank. This method involves emplacement of 15 lbs. of dry ice per thousand gallons of tank capacity.

16. Laboratories

Name Thermo Analytical Inc.

Address 2030 Wright Avenue

City Richmond State CA Zip 94804

State Certification No. 208

(Continued next page)

13. Sampling Information for each tank or area

Tank or Area Tank 2		Material sampled	Location & Depth
Capacity 10,000 gallons	Historic Contents (past 5 years) Tank at least 30 years old. Reportedly stores gasoline but tank labelled Diesel #2. Currently contains small amount of oily amber liquid with slight gas or solvent odor with surface beads of oil or water.	Oily amber liquid (tank sample)	Central site area, northern most tank east of fuel island. Bottom of tank: 10.58 feet
		Soil (BH-5) Soil (EB-1) Soil (MW-1) Water (MW-1)	West of tank, 2.5 feet West of tank, 3.0 feet Southwest of tank, 5.0 feet Southwest of tank

16. Laboratories (Cont'd)

Engineering-Science, Inc.
600 Bancroft Way
Berkeley, California 94710
State Certification No. 170

Brown and Caldwell Laboratories
1255 Powell Street
Emeryville, California 94608
State Certification No. 104

13. Sampling Information for each tank or area

Tank or Area Tank 3		Material sampled	Location & Depth
Capacity	Historic Contents (past 5 years)		
10,000 gallons	Tank is 20 to 30 years old. Stored gasoline until 1981. Currently stores small amount of diesel fuel.	Amber liquid (tank sample)	Central site area, southern most tank east of fuel island. Bottom of tank: 10.75 feet
		Soil (BH-4)	West of tank, 2.5 feet
		Soil (BH-6)	West of tank, 1.0 feet

13. Sampling Information for each tank or area

Tank or Area Tank 4		Material sampled	Location & Depth
Capacity 10,000 gallons	Historic Contents (past 5 years) Tank is roughly 20 years old. Intially contained #2 boiler fuel; currently contains small amount of dark brown oil (#6 boiler fuel?) and possibly animal fat.	Dark brown oil (tank sample)	Sample of former boiler room in southern site area. Bottom of tank: 10.79 feet
		Soil (EB-3) Soil (BH-7)	West of tank, 3.0 feet Southwest of tank, 3.5 feet and 9.5 feet (composite)

17. Chemical Methods to be used for Analyzing Samples

DRAFT

Contaminant Sought	EPA, DHS, or Other Sample Preparation Method Number	EPA, DHS, or Other Analysis Number
Tank 1: Diesel; benzene toluene, xylene (each sample)	EPA Method 3550, Sonication Extraction	GC/FID modified 8015/8020
Hexane (one sample)	EPA Method 5030	EPA Method 8240 (GC/MS)
Oil and Grease (one sample)	EPA Method 3550, Solvent Extraction	Standard Method 503 A and E
Tanks 2 & 3: Gasoline and/or Diesel; benzene, toluene xylene (each sample)	EPA Method 5020 or 5030/ EPA Method 3550, Sonication Extraction	GC/FID modified 8015/8020
Tank 4: Diesel/Boiler fuel (each sample) & BTX	EPA Method 3550, Sonication Extraction	GC/FID modified 8015/8020
Volatile Organic Compounds (one sample)	EPA Method 5030	EPA Method 8240 (GC/MS)
Oil and Grease (one sample)	EPA Method 3550, Solvent Extraction	Standard Method 503 A and E

18. Site Safety Plan submitted? Yes [ ] No [x] Site safety plan will be submitted before tank excavation start

19. Workman's Compensation: Yes [x] No [ ]

Copy of Certificate enclosed? Yes [x] No [ ] as Attachment D

Name of Insurer California Casualty

20. Plot Plan submitted? Yes [x] No [ ]

21. Deposit enclosed? Yes [ ] No [x] Deposit has already been submitted.

22. Please forward to this office the following information within 60 days after receipt of sample results.

a) Chain of Custody Sheets

b) Original Signed Laboratory Reports

c) TSD to Generator copies of wastes shipped and received

d) Attachment A summarizing laboratory results

DRAFT

I declare that to the best of my knowledge and belief the statements and information provided above are correct and true. I understand that information in addition to that provided above may be needed in order to obtain an approval from the Department of Environmental Health and that no work is to begin on this project until this plan is approved.

I understand that any changes in design, materials or equipment will void this plan if prior approval is not obtained.

I will notify the Department of Environmental Health at least two (2) working days (48 hours) in advance to schedule any required inspections. I understand that site and worker safety are soley the responsibility of the property owner or his agent and that this responsibility is not shared nor assumed by the County of Alameda.

Signature of Contractor

Name (please type) FRED S. GLUECK

Signature Fred S. Glueck

Date 3/11/88

Signature of Site Owner or Operator

Name (please type) MARK SCHER

Signature

Date 3/8/88

NOTES:

1. Any changes in this document must be approved by this Department.
2. Any leaks discovered must be submitted to this office on an underground storage tank unauthorized leak/contamination site report form within 5 days of its discovery.
3. Three (3) copies of this plan must be submitted to this Department. One copy must be at the construction site at all times.
4. A copy of your approved plan must be sent to the landowner.

Attachment B

EMERYVILLE FIRE DEPARTMENT
FIRE PREVENTION BUREAU
6303 HOLLIS STREET
EMERYVILLE, CA 94608
655-7678

CITY OF EMERYVILLE

FIRE CODE PERMIT

No 1072

PERMISSION IS HEREBY GRANTED Plant Reclamation

TO ~~OPERATE~~ ~~MAINTAIN~~ ~~STORE~~ Remove 4 UG tanks(Petersen Tallow)

ON PREMISES LOCATED AT 1600-63rd Street

PERIODIC INSPECTIONS ARE A CONDITION OF THIS PERMIT WHICH IS ISSUED IN ACCORDANCE WITH UNIFORM FIRE CODE, AS SPECIFIED IN SECTION 4.101 OF SAID CODE.

ADDITION REQUIREMENTS notify Fire Dept. 24-hrs in advance of removal

ENG. CO. DISTRICT # 3 EXPIRATION DATE:

THIS PERMIT MUST BE POSTED WITH BUSINESS LICENSE

PERMIT APPROVED BY

George Warren Inspector 2/19/88

FIRE MARSHAL DATE

ATTACHMENT C

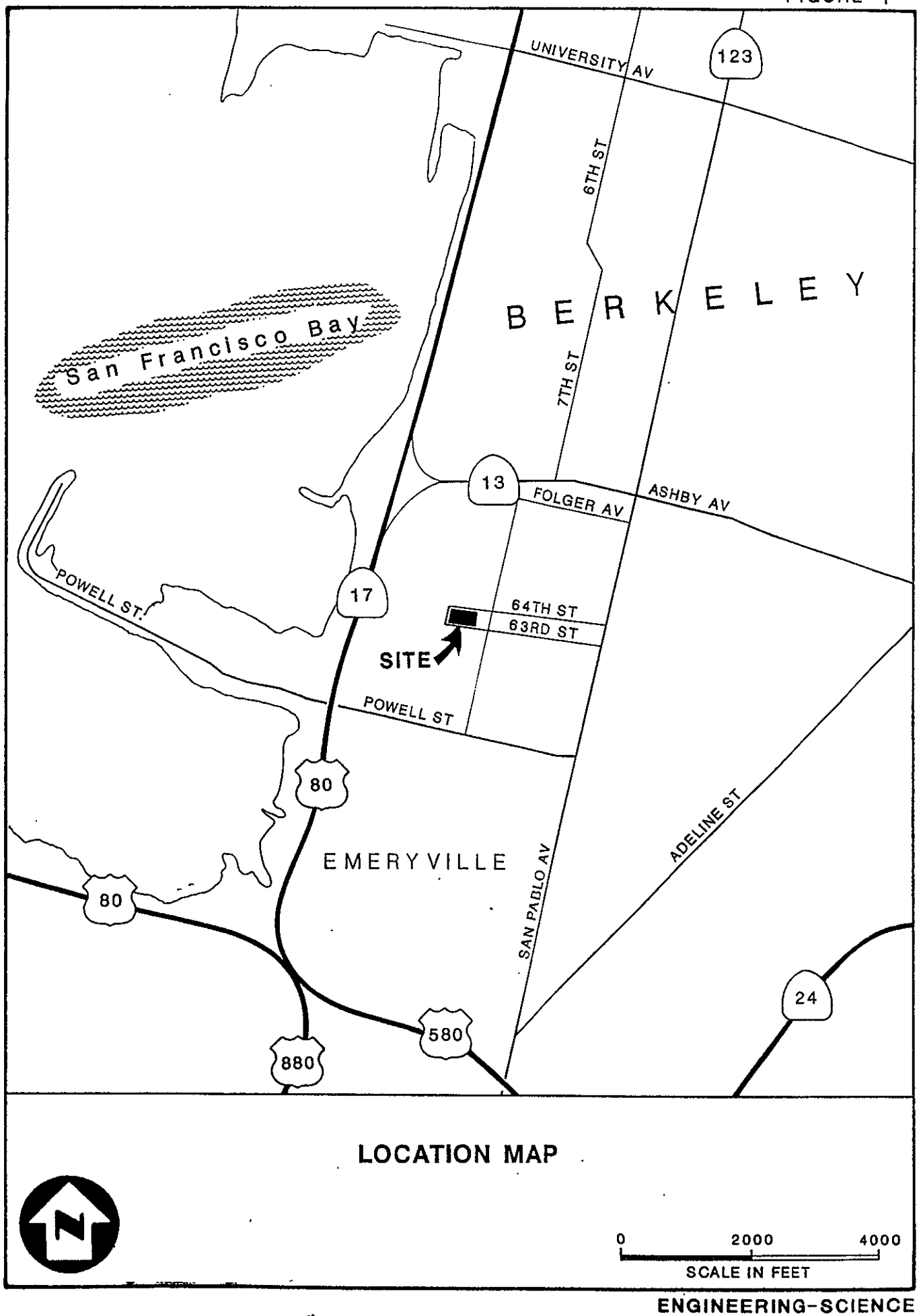
Contaminated soil will be excavated during removal of the underground storage tanks. Based on soil borings and an assumed excavation depth of 12 feet, roughly 930 cubic yards of soil will require excavation. Figure 4 shows the proposed tank and soil excavation areas.

The excavated soil, contaminated by gasoline and diesel fuel, will be remediated on-site through landfarming and tilling. This process will reduce hydrocarbon levels through the combined effects of aeration, exposure to the ultraviolet component of sunlight, and activity of indigenous microorganisms.

Soil from the area of Tanks 2 and 3 is contaminated by gasoline and will be landfarmed and tilled in conformance with Regulation 8, Organic Compounds Rule 40, Aeration of Contaminated Soil and Removal of Underground Storage Tanks. Soil from the Tank 1 area is contaminated by diesel fuel and is therefore exempt from Regulation 8, Rule 40. This soil will be landfarmed separately and will be tilled to maximize aeration effectiveness.

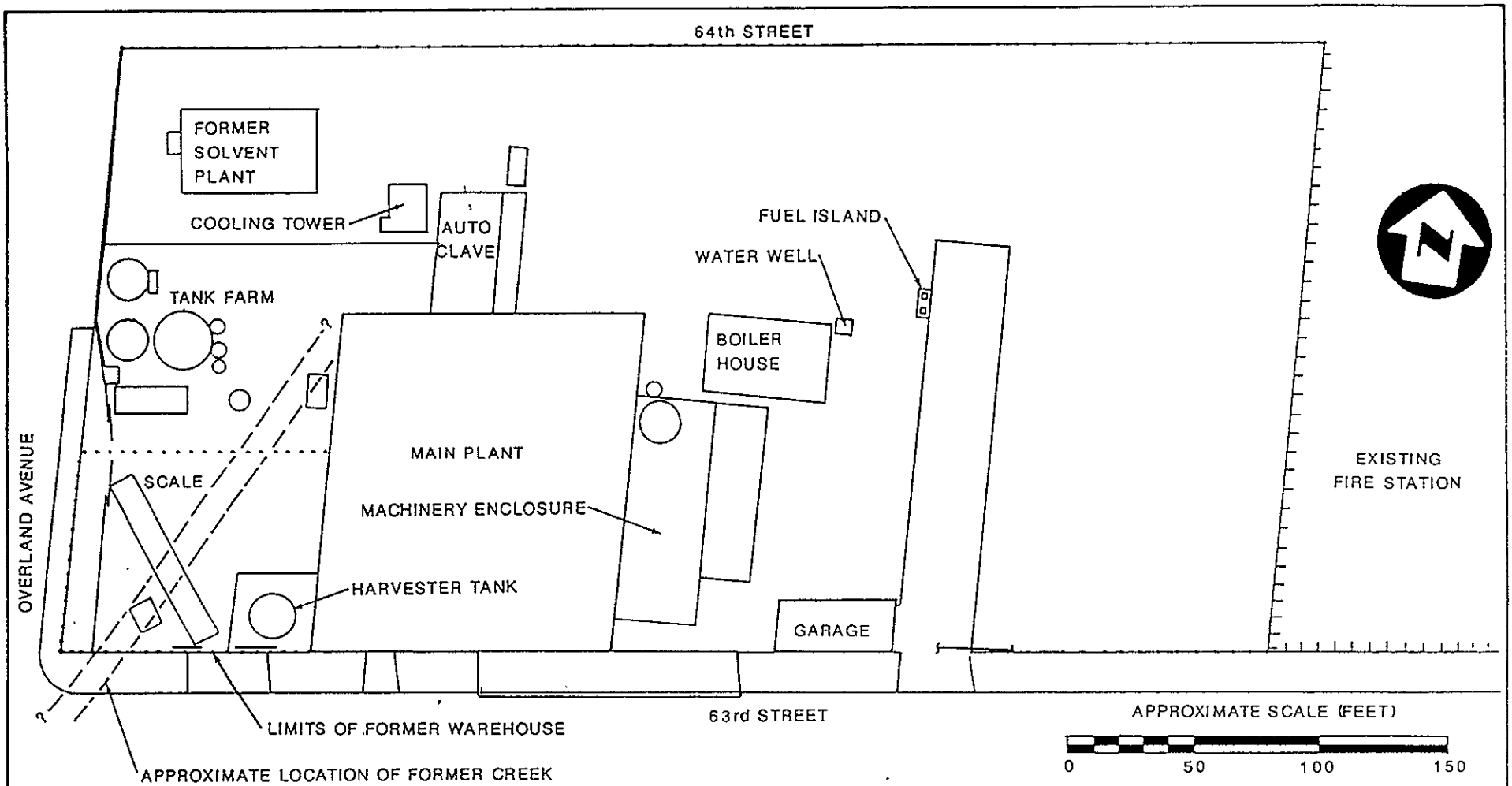
Landfarming and tilling will continue until volatile organic compound concentrations fall to levels at which the Alameda County Department of Environmental Services and the Regional Water Quality Control Board will permit the soil to be used as backfill.

FIGURE 1



LOCATION MAP

ENGINEERING-SCIENCE

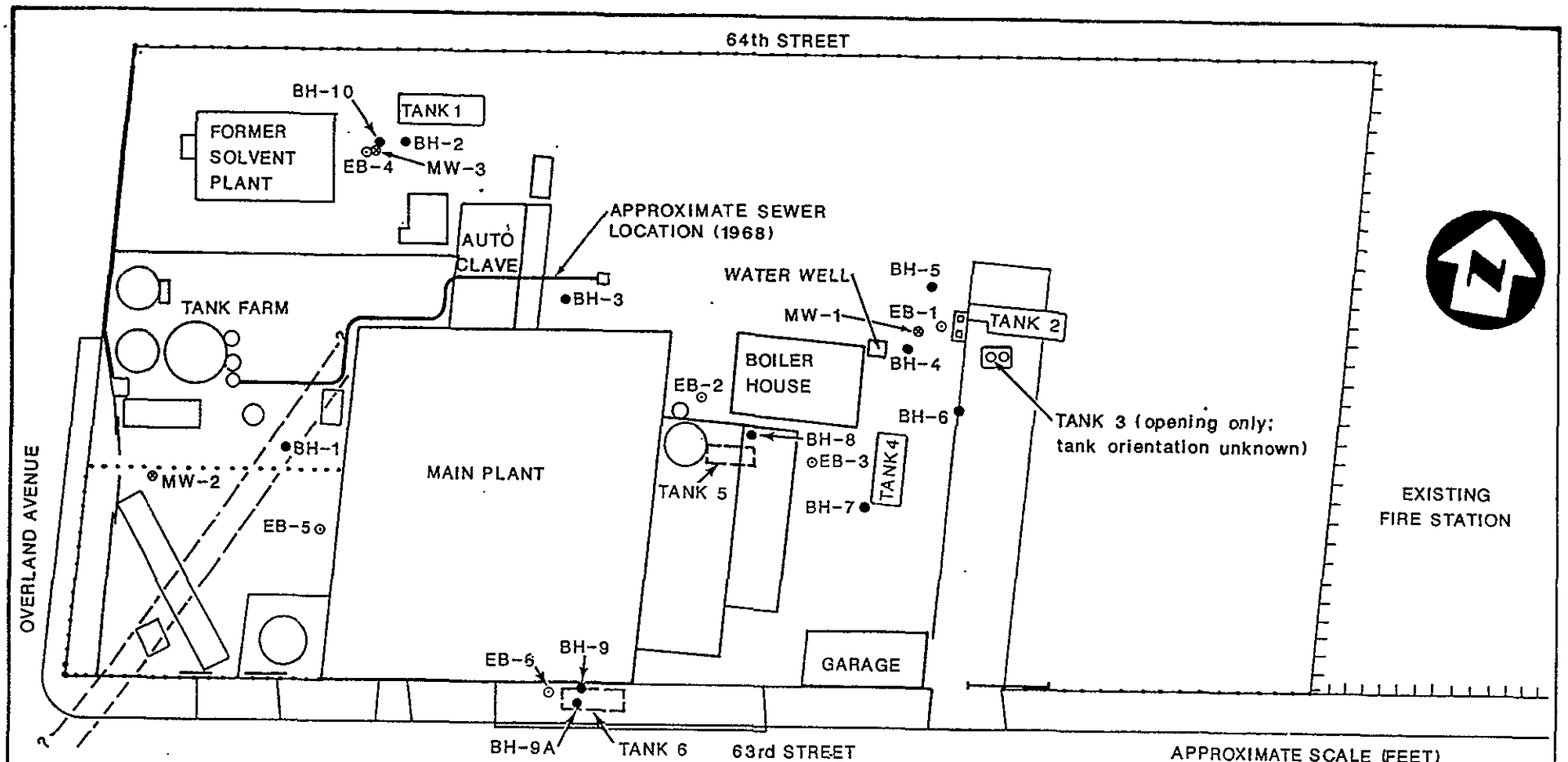


SITE PLAN
PETERSON MANUFACTURING CO. PARCEL
EMERYVILLE, CALIFORNIA

Base: "Plot Plan", by John F. Tulloch, Engineers, Contractors, dated January 24, 1968.

ENGINEERING-SCIENCE

FIGURE 2



LEGEND:

- TANK 5 — FORMER UNDERGROUND STORAGE TANK, APPROXIMATE LOCATION
- TANK 1 — EXISTING UNDERGROUND STORAGE TANK
- ● BH-1 — ES BOREHOLE
- ⊙ EB-1 — KALDVEER BORING, APPROXIMATE LOCATION
- ⊗ MW-2 — ES MONITORING WELL

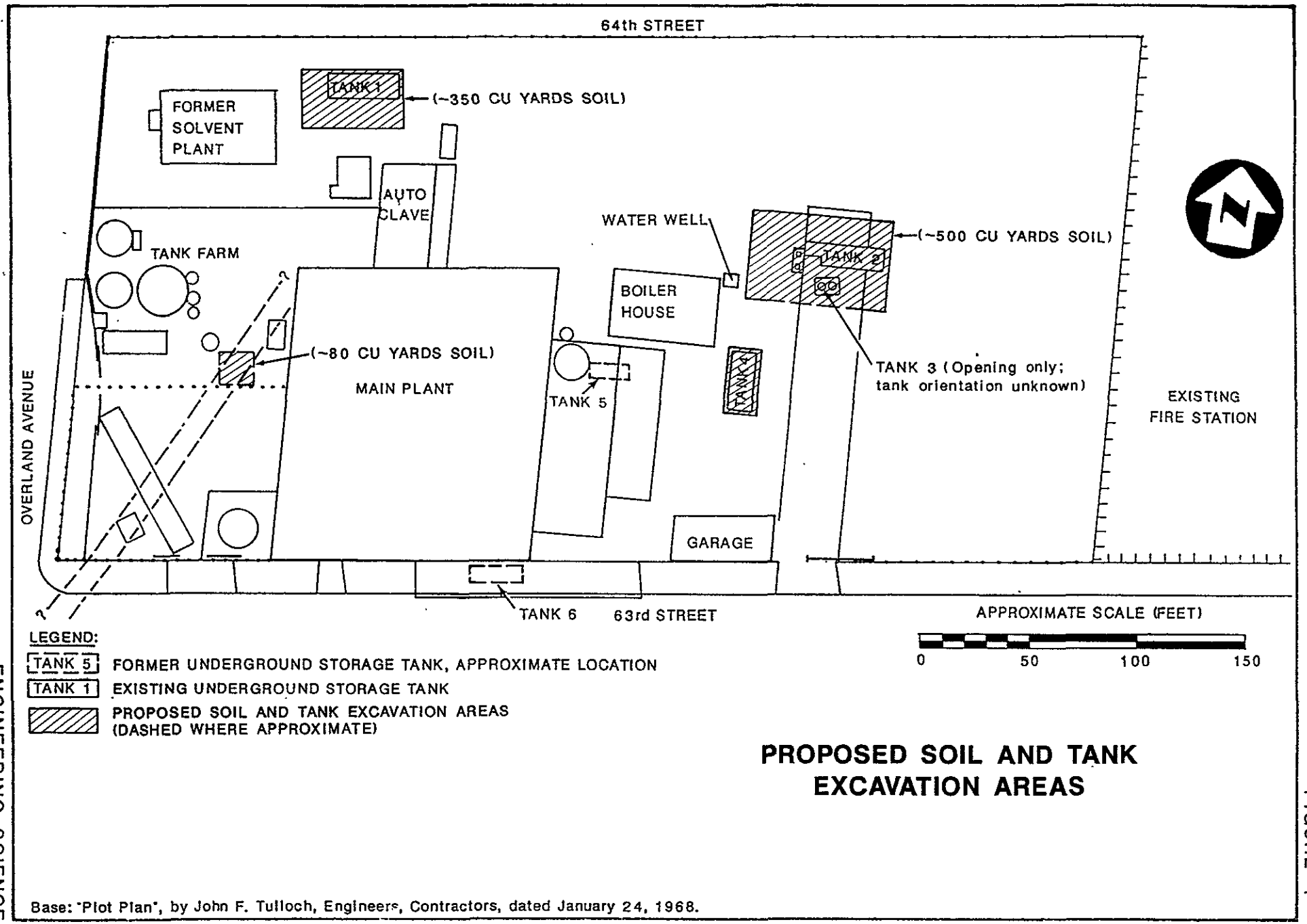
APPROXIMATE DEPTH TO GROUNDWATER: 9.5 FEET (PERCH WATER ZONES AND SEMI CONFINED NATURE OF AQUIFERS PREVENT ACCURATE GROUNDWATER DEPTH DETERMINATION)

TANK, WELL AND SOIL BORING LOCATIONS
PETERSON MANUFACTURING CO. PARCEL
EMERYVILLE, CALIFORNIA

Base: "Plot Plan", by John F. Tulloch, Engineers, Contractors, dated January 24, 1968.

ENGINEERING-SCIENCE

FIGURE 3



PROPOSED SOIL AND TANK EXCAVATION AREAS

Base: "Plot Plan", by John F. Tulloch, Engineers, Contractors, dated January 24, 1968.

ENGINEERING-SCIENCE

FIGURE 4

Attachment D

acord CERTIFICATE OF INSURANCE

ISSUE DATE (MM/DD/YY) 1/26/88

PRODUCER

CALIFORNIA CASUALTY
P.O. BOX M
SAN MATEO, CA 94402

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

S.S.P. RECLAMATION DBA:
Plant Reclamation/Schnitzer Steel
912 Harbor Way South
Richmond, CA 94804

COMPANIES AFFORDING COVERAGE

COMPANY LETTER A	CALIFORNIA CASUALTY INDEMNITY EXCHANGE
COMPANY LETTER B	
COMPANY LETTER C	
COMPANY LETTER D	
COMPANY LETTER E	

COVERAGES

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	ALL LIMITS IN THOUSANDS
	GENERAL LIABILITY COMMERCIAL GENERAL LIABILITY ☐ CLAIMS MADE ☐ OCCURRENCE OWNER'S & CONTRACTORS PROTECTIVE				GENERAL AGGREGATE $ PRODUCTS-COMP/OPS AGGREGATE $ PERSONAL & ADVERTISING INJURY $ EACH OCCURRENCE $ FIRE DAMAGE (ANY ONE FIRE) $ MEDICAL EXPENSE (ANY ONE PERSON) $
	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS GARAGE LIABILITY				CSL $ BODILY INJURY (PER PERSON) $ BODILY INJURY (PER ACCIDENT) $ PROPERTY DAMAGE $
	EXCESS LIABILITY OTHER THAN UMBRELLA FORM				EACH OCCURRENCE $ AGGREGATE $
A	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY	2 00 0299	1/1/88	1/1/89	STATUTORY $ 1,000, (EACH ACCIDENT) $ 1,000, (DISEASE-POLICY LIMIT) $ 1,000, (DISEASE-EACH EMPLOYEE)
	OTHER				

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/RESTRICTIONS/SPECIAL ITEMS

CERTIFICATE HOLDER

City of Emeryville
2200 Powell Street
Emeryville, CA 94608

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

State of California—Health and Welfare Agency
Form Approved OMB No. 2050—0039 (Expires 9-30-88)
Please print or type. (Form designed for use on elite (12-pitch typewriter).

Department of Health Services
Toxic Substances Control Division
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: CAC000064473 Manifest Document No.: 00013
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

A. State Manifest Document Number: 87521335

3. Generator's Name and Mailing Address: WARMAN PROPERTIES GROUP, 1120 NYE ST, SAN RAFAEL CA 94915
4. Generator's Phone (415) 457-4164

B. State Generator's ID: HAHA36-0122296

5. Transporter 1 Company Name: ERICKSON, INC
6. US EPA ID Number: CAD009466392
C. State Transporter's ID: 801272
D. Transporter's Phone: (415) 235-1393

7. Transporter 2 Company Name:
8. US EPA ID Number:
E. State Transporter's ID:
F. Transporter's Phone:

9. Designated Facility Name and Site Address: ERICKSON INC, 255 PARR BLVD, RICHMOND CA 94560
10. US EPA ID Number: CAD009466392
G. State Facility's ID:
H. Facility's Phone: (415) 235-1393

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. WASTE, EMPTY STORAGE TANK CALIFORNIA Regulated waste only	001	TP	6000	P	State 512; EPA/Other NONE
b.					State; EPA/Other
c.					State; EPA/Other
d.					State; EPA/Other

J. Additional Descriptions for Materials Listed Above: Empty gasoline tank, #730 iced with 150 lbs dry ice. (aka UST tank #2)

K. Handling Codes for Wastes Listed Above: a. b. c. d.

15. Special Handling Instructions and Additional Information: Gloves safety glasses.

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Printed/Typed Name: MARK SCOTT P Warman Property Group, Agent for [illegible] | Signature: [signature] Environmental Consultants for MARY SCHOLZ | Month Day Year: 04 11 88

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: WAYNE L. BEATTIE | Signature: [signature] | Month Day Year: 04 11 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: | Signature: | Month Day Year:

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: | Signature: | Month Day Year:

GENERATOR / TRANSPORTER / FACILITY

DHS 8022 A (1/87)
EPA 8700—22
(Rev. 9-86) Previous editions are obsolete

YELLOW: GENERATOR RETAINS

INSTRUCTIONS ON THE BACK

IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA CALL 1-800-852-7550

State of California—Health and Welfare Agency
Form Approved OMB No. 2050—0039 (Expires 9-30-88)
Please print or type. *(Form designed for use on elite (12-pitch typewriter).*

Department of Health Services
Toxic Substances Control Division
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: CAK000 [illegible]
Manifest Document No.: [illegible]
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address: [illegible handwriting]
4. Generator's Phone ( ) [illegible]

A. State Manifest Document Number: 87621332
B. State Generator's ID: [illegible]

5. Transporter 1 Company Name: [illegible]
6. US EPA ID Number: [illegible]
C. State Transporter's ID: 802837
D. Transporter's Phone: (415) [illegible]

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address: [illegible handwriting]
10. US EPA ID Number: [illegible]
G. State Facility's ID
H. Facility's Phone: (415) 235-1312

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Waste empty storage tank [illegible]	001	TP	[illegible]	P	State: 512; EPA/Other: [illegible]
b.					State; EPA/Other
c.					State; EPA/Other
d.					State; EPA/Other

J. Additional Descriptions for Materials Listed Above
Empty Diesel tank [illegible]
tank 732 (aka UST 3)

K. Handling Codes for Wastes Listed Above
a. b. c. d.

15. Special Handling Instructions and Additional Information
[illegible]

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Printed/Typed Name: [illegible]
Signature: [signature]
Month Day Year: [illegible] 88

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Paul [illegible]
Signature: [signature]
Month Day Year: [illegible] 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Month Day Year

GENERATOR / TRANSPORTER / FACILITY

DHS 8022 A (1/87)
EPA 8700—22
(Rev. 9-86) Previous editions are obsolete.

YELLOW: GENERATOR RETAINS

INSTRUCTIONS ON THE BACK

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Department of Health Services
Toxic Substances Control Division
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: CAC010016473 | Manifest Document No.: 00095

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

GENERATOR

3. Generator's Name and Mailing Address: WAREHAM PROPERTIES GROUP (1600 63rd ST. ASSOC.)
1120 NYE STREET
SAN RAFAEL, CA 94915
4. Generator's Phone (415) 457-4964

A. State Manifest Document Number: 87621329
B. State Generator's ID: HAHQ361-0224216

5. Transporter 1 Company Name: ERICKSON, INC
6. US EPA ID Number: CAD009416392
C. State Transporter's ID: 802 837
D. Transporter's Phone: (415) 235-1313

7. Transporter 2 Company Name:
8. US EPA ID Number:
E. State Transporter's ID:
F. Transporter's Phone:

9. Designated Facility Name and Site Address: ERICKSON, INC
255 PARR BLVD
RICHMOND, CA 94560
10. US EPA ID Number: CAD009416392
G. State Facility's ID:
H. Facility's Phone: (415) 235-1373

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. WASTE EMPTY STORAGE TANK CALIFORNIA REGULATED WASTE ONLY	001	TP	16000	P	State 512 / EPA/Other NONE
b.					State / EPA/Other
c.					State / EPA/Other
d.					State / EPA/Other

J. Additional Descriptions for Materials Listed Above: EMPTY #6 BUNKER OIL; #731 ICE UNIT; 15,000 GAL ICE (a.k.a. UST-4)

K. Handling Codes for Wastes Listed Above: a. b. c. d.

15. Special Handling Instructions and Additional Information: GLOVES, SAFETY GLASSES

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Printed/Typed Name: MARK SCHER for (1600 63rd ST ASSOC) | Signature: for MARK SCHER | Month Day Year: 04/11/88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: PAUL L ROTE | Signature | Month Day Year: 04/11/88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name | Signature | Month Day Year

DHS 8022 A (1/87)
EPA 8700—22
(Rev. 9-86) Previous editions are obsolete.

YELLOW: GENERATOR RETAINS

INSTRUCTIONS ON THE BACK

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Department of Health Services
Toxic Substances Control Division
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. | Manifest Document No. 0010010

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address

4. Generator's Phone ( )

A. State Manifest Document Number 87505038

B. State Generator's ID

5. Transporter 1 Company Name | 6. US EPA ID Number

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address | 10. US EPA ID Number

G. State Facility's ID

H. Facility's Phone

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	001	TT	113100	G	State / EPA/Other
b.					State / EPA/Other
c.					State / EPA/Other
d.					State / EPA/Other

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above
a. | b.
c. | d.

15. Special Handling Instructions and Additional Information
GLOVES + GOGGLES

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GENERATOR

Printed/Typed Name	Signature	Month	Day	Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
JERRY L. HULSEY		05	24	88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

TRANSPORTER

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

DHS 8022 A (1/87)
EPA 8700—22
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Department of Health Services
Toxic Substances Control Division
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CAC000644738 Manifest Document No. 00004
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Wareham Properties Group
1120 Nye St
San Rafael, CA 94915
4. Generator's Phone (415) 457-4464

A. State Manifest Document Number 87621331
B. State Generator's ID HAA036-922916

5. Transporter 1 Company Name: Erickson Inc
6. US EPA ID Number: CAD009466392
C. State Transporter's ID 80272
D. Transporter's Phone (415) 235-1313

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
Erickson, Inc
255 Park Blvd
Richmond CA 94560
10. US EPA ID Number: CAD009466392
G. State Facility's ID
H. Facility's Phone (415) 235-1393

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Waste empty storage tank California Regulated Waste only	001	TP	16000	P	State 512 EPA/Other None
b.					State EPA/Other
c.					State EPA/Other
d.					State EPA/Other

J. Additional Descriptions for Materials Listed Above
Empty Hexane tank, # 729 iced with 150 lbs dry ice. (aka UST 1)

K. Handling Codes for Wastes Listed Above
a. b. c. d.

15. Special Handling Instructions and Additional Information
Gloves — safety glasses.

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Printed/Typed Name: Mark Sauer [illegible] | Signature: [signature] | Month Day Year: [illegible]

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Wayne L. Beattie | Signature: [signature] | Month Day Year: [illegible]

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Month Day Year

19. Discrepancy Indication Space

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Printed/Typed Name | Signature | Month Day Year

GENERATOR / TRANSPORTER / FACILITY

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